March 31, 1962
Vol. 162—No. 13

Telephony

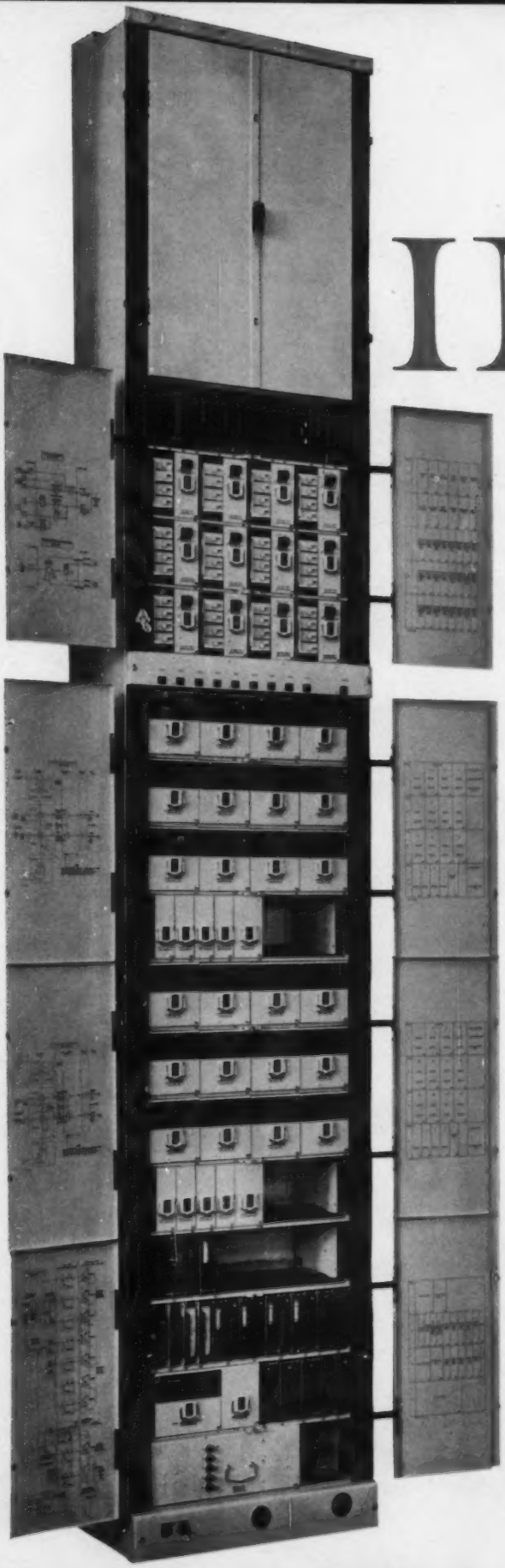
THE JOURNAL OF THE TELEPHONE INDUSTRY

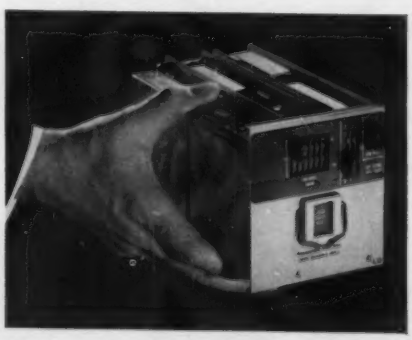
Huge horn antenna at Andover, Me., for Bell System's Project Telstar, points upwards as though tracking Telstar satellite. Horn will transmit signals to, and receive signals from, the satellite, a "space radio relay tower". See story on project, page 28.

Circulation This Issue
14,493 of Which
13,910 Is Paid

MANAGEMENT · PLANT · TRAFFIC · COMMERCIAL · LEGAL · ACCOUNTING

INTRO





Channel units, with signaling modules, are 4⅛" wide x 4½" high x 7⅝" deep.

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Output—Printed ticket—system convertible to tape.

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COMPANY NAME _____

ADDRESS _____

CITY AND STATE _____

FLASHES AND PLUGS

HIGH MOMENTS IN COMMUNICATION. Among the greatest emotional thrills the American people have experienced have been those of communications' advance, the New York "Herald Tribune" recently pointed out.

Sharpest in our minds, of course, is Lt. Col. John H. Glenn's circling the globe three times in one day, and communicating with his base via the space capsule.

Back in 1858, there was another moment of high excitement when on Aug. 10, it was announced that a cable had been successfully laid under the Atlantic Ocean from Europe. This copper cable, stretching from Ireland to Newfoundland, brought the exchange of greetings between Queen Victoria and President Buchanan. So many fireworks were let off, a diarist recorded, that the New York City Hall caught fire.

George Templeton Strong, in his diary published by Macmillan Co. in 1952, recorded in 1858:

"Everbody all agog about the Atlantic cable. Telegraph offices in Wall Street decorated with flags of all nations . . . Newspapers full of the theme and of demonstrations the event has produced from New Orleans to Portland. . . Moderate people . . . say that this is the greatest human achievement . . ."

Need we say that another first for America was the introduction of the telephone, and that this, too, was greeted with great enthusiasm?

•

NO SMOKE—NO BLOKE RINGS UP. The village fathers of Upton, England, reports the AP, are closing down their fire station, for lack of business.

The station was built 52 years ago, but no one can remember the brigade's ever having been called out.

Besides, if there were a fire, the cart could not be brought out, because they've bricked up the doorway. Furthermore, the only fireman left is 80-year-old George Stimpson, and he lives 5 miles away.

•

EXTENSION "WAY OUT". Telephone callers to the Dayton, O., Air Force Depot may get a start when someone answers, "Main Gate, St. Peter speaking."

No, the UPI informs us, the Air Force does not have a direct line to heaven. It is just civilian guard, Jay St. Peter, responding as he naturally would when the telephone rings.

•

BUG BOOMERANGS. An F.B.I. agent in Connecticut noticed some strange new wiring in his house. Convinced that someone had tapped his telephone line, he ripped it out.

Only then did his wife tell him it had been installed for the stereo record player she had planned as his birthday surprise.—from "Short Circuits" in "What's New in Electronics."

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

SINCE 1901

March 31, 1962

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Published every week on Saturday by TELEPHONY PUBLISHING CORP., 608 S. Dearborn St., Chicago 5, Ill. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879. 30c per copy (except special issues—50c). Subscription $4.50, 1-year; $7.00, 2-years; $9.00, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone: 922-2435 (DDD Area Code 312).

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Economical. Get top gas mileage. Convenient. Walk in either side. New safety, with maximum up-front visibility. Highly maneuverable and compact. Saves up to 25% parking space in your garage or lot. Rugged construction for low-cost maintenance.

Payload	1000 pounds
Engine	Hurricane, 4 Cyl. F-head, 75 hp
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Interior Height Rear Load Area	63½ inches
Length of Load Area	87½ inches
Interior Width Load Area (at rear)	57 inches

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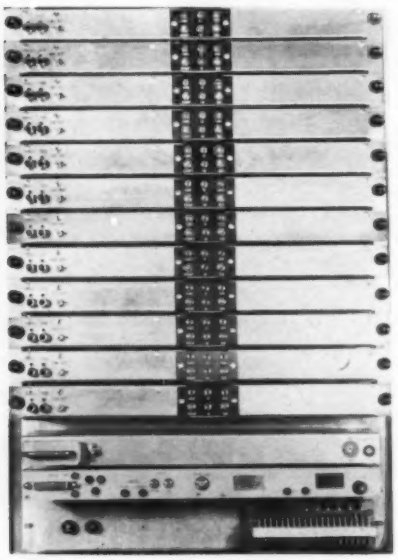
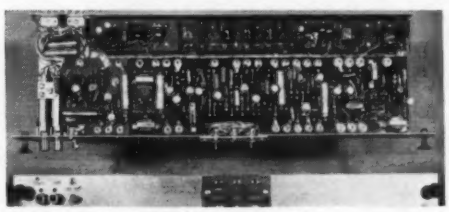
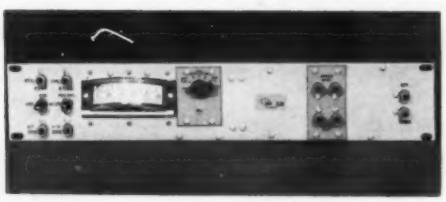


Panhandle's type LN Carrier is a fully transistorized twelve channel cable carrier for use over toll or exchange grade cables. It is the only cable carrier permitting connection with Western Electric Company's Nl Carrier on joint trunk facilities. It employs double sideband transmitted carrier transmission, using the same channel frequencies and carrier levels as the Nl. It operates on a four-wire basis with different frequency bands applied to the line for the two directions of transmission.

An LN Carrier terminal is arranged for voice frequency channel drops to operate on a four-wire basis. Like the Nl, external coil hybrids with the associated balancing networks and cable buildout provisions can be used.





A test panel is available which is designed to mount on a 19 inch rack. It is equipped with an order wire circuit and a terminal test set. The order wire circuit is designed to connect to an extra pair in the same cable over which the carrier is transmitted, and is looped through each repeater point along the lead. The circuit provides talking battery on a local basis at the terminal, and provides a common battery circuit over the cable.

TO ANNOUNCE

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And what's so new about it?

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Sounds good. But what about power requirements?

A fully equipped LN terminal requires 1.7 amperes at 48 volts DC. The terminals are designed to operate from a standard central office battery with a voltage level between 48 and 54 volts.

And cross-talk balancing?

Companders are provided as an integral part of each channel unit. Their use eliminates the need of cross-talk balancing and special noise treatment of the cable pairs. This leads to more lenient selectivity requirements for the receiving channel filters.

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Little maintenance . . . the Alumilite* finish needs only soap and water, not paint and brush, to stay clean and bright. Alcoa "Compacts" are sturdily built of heat-treated Alcoa Aluminum Extrusions to resist damage and vandalism.

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*Trade Name of Aluminum Company of America

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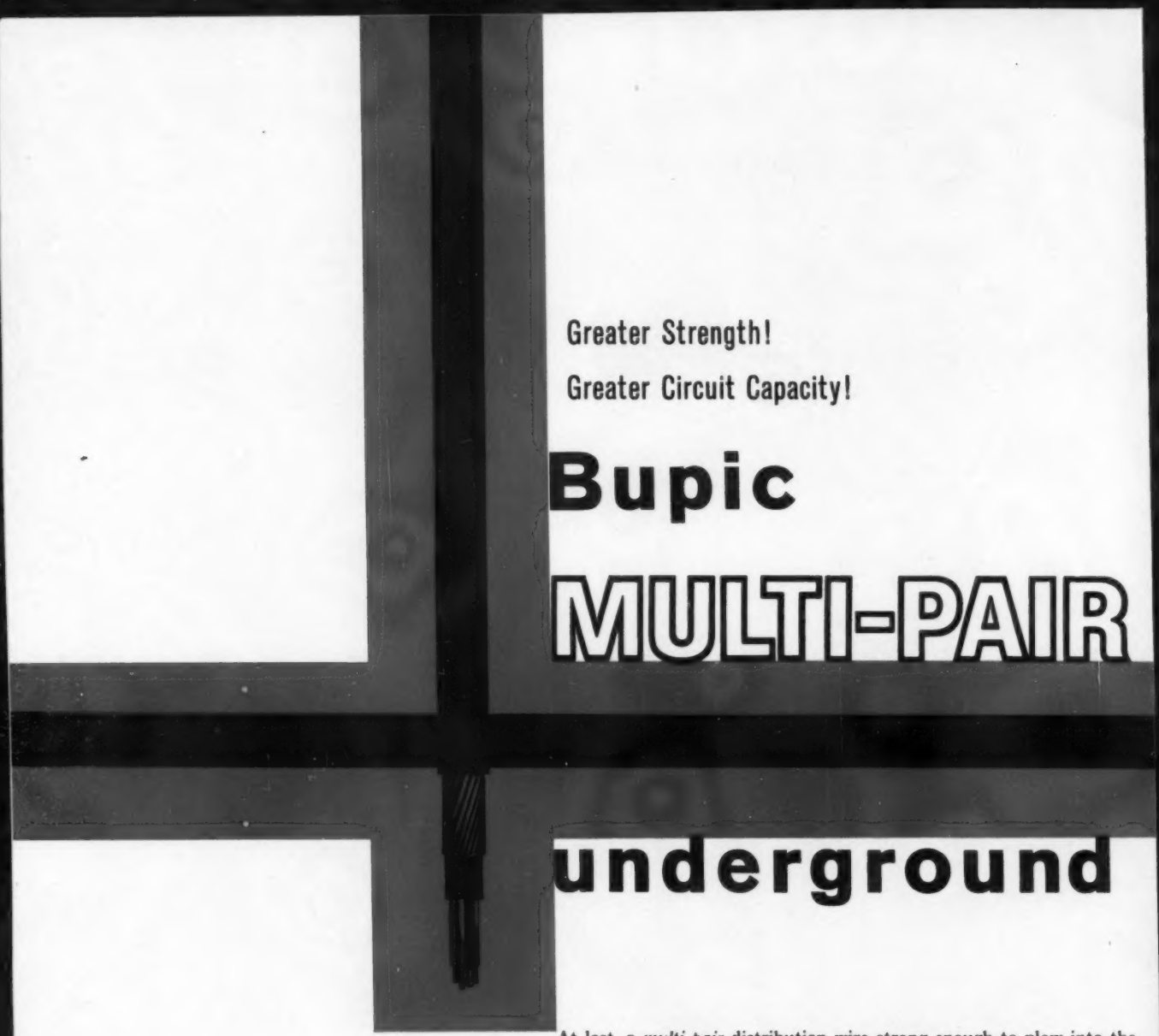

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"LEICH'S MOTEL-HOTEL GREATLY IMPROVES TO OUR GUESTS"

reports Mr. John B. Maloney, owner White Inn, Fredonia, New York

Shown with Leich attendant's turret and message register cabinet are left to right: Miss Mabel Lehnen, assistant hotel manager; Robert Maytum, President of Dunkirk and Fredonia Telephone Company; Edward T. Wragg, plant superintendent; John Maloney, hotel owner.

LEICH

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PABX SERVICE

The Dunkirk and Fredonia (N.Y.) Telephone Company has a happy subscriber in hotel owner John Maloney. He's building good will and good business by furnishing modern communications to guests at his White Inn hotel.

"Guests really appreciate the speed and convenience of PABX service," says Mr. Maloney. "We attract new customers, and get more return business, too."

With Leich's 40M PABX, his guests call other hotel rooms by simply dialing two digits. They can also dial single digits to reach room service, the dining room, the turret attendant and other hotel facilities.

To make outside calls to the main exchange, guests simply dial "9", wait for dial tone, and dial the number they want. A message register cabinet, mounted above the attendant's turret, automatically records the number of outgoing calls made by each guest. Outgoing toll calls are automatically diverted to the turret attendant, who places these calls and records them.

Incoming city trunk calls are also answered by the turret attendant. She quickly connects the caller to the proper inside room by pressing two buttons in sequence on the turret.

Like to tell motel-hotel owners in your area about modern Leich PABX service? Write today. We'd be happy to send you our free sales brochure and service feature lists on Leich's two types of motel-hotel PABX.

Admiring compact Leich dial switching equipment with Messrs. Maytum, Maloney, and Wragg are Leich representatives H. W. Skidmore, J. J. Bolger, and P. P. Barnes.

Built in 1921, the historical White Inn is one of the original 37 members of the Duncan Hines Family.

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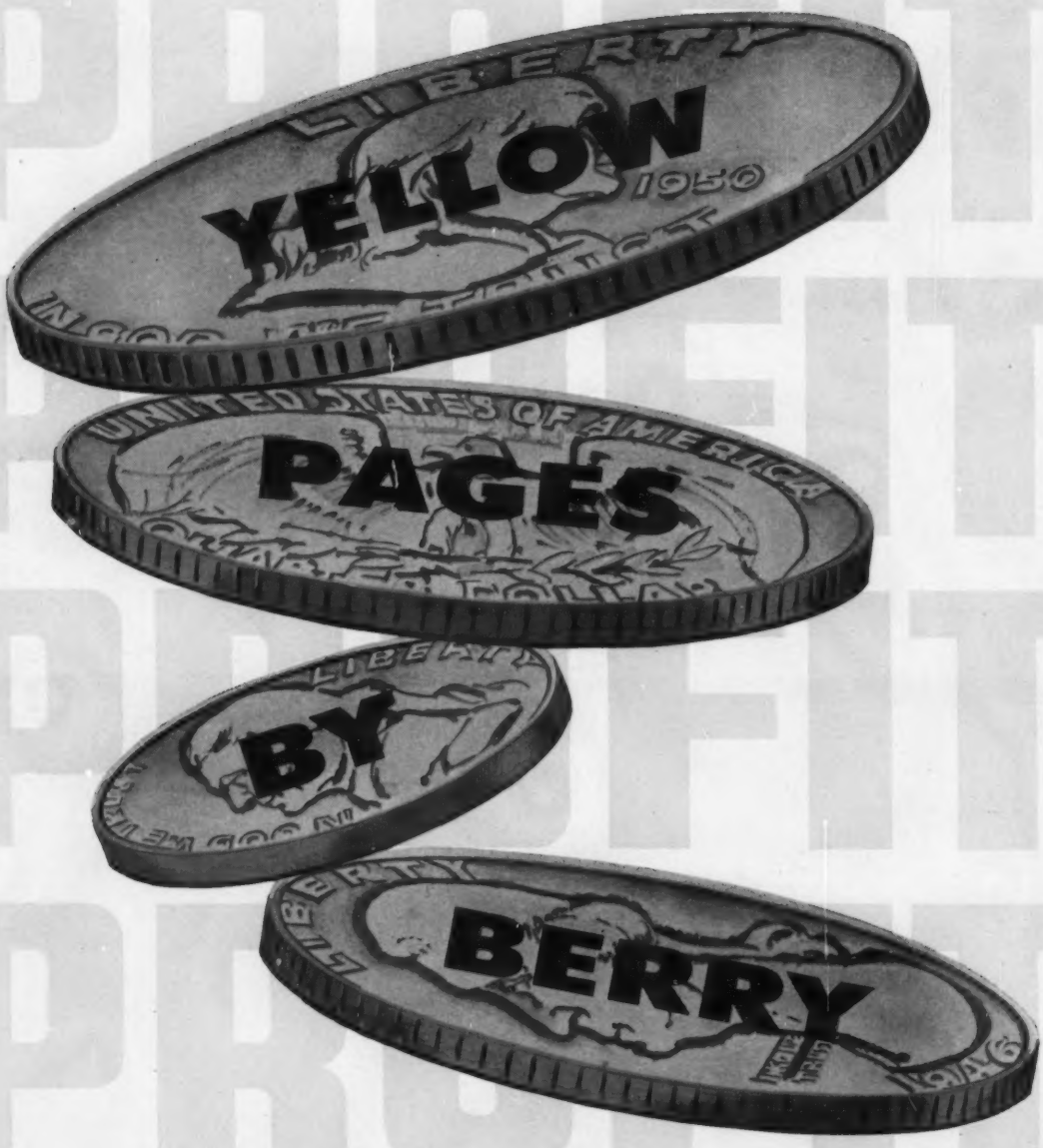

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EDITORIAL

A TVA in the Sky—Bye and Bye?

WHAT DO THE Independent telephone people really think about all this talk going on in Washington regarding a system of communications satellites? If a special poll or opinion survey were taken of their reactions to the discussion along this line in congressional hearings and elsewhere, what would it show? *(See "About Space Communications" by R. O. Beck on page 22)*

Not having ready access to such a professional poll or survey, we have tried to ask a few questions of our own, among representative Independent people to test the attitude. The result, so far, as near as we can make out, can be summed up in one word: "vague." The typical Independent telephone man naturally follows the news items about the proposed launching of satellites with great interest. He is aware that telephone industry research, including both Bell and Independent branches, has developed a series of alternative proposals for hoisting these satellites into various orbits. He knows that, once launched and operating, these satellites will be capable of relaying a great volume of transoceanic long distance telephone and other communications traffic.

When he considers what place his own interests may occupy in these exciting new plans, the typical Independent man assumes, in a general way, that some day his company will be originating, and terminating calls of this nature, and that, therefore, the satellite relays might well result in a nice piece of new business. It is at that point that the vagueness begins. Whether the government, the Bell System, or a combination of common carriers do the space work does not seem to make our typical Independent telephone man very excited. Should he be?

We think he should. More than that, we think it is long past the time when the Independents can afford to be complaisant about what is happening in Washington. What Congress does about this could affect both Bell and Independents very basically in the years to come. To put it bluntly, the way the issue of government *versus* private ownership of satellites is decided might well decide what will be done about government *versus* private ownership of the telephone business.

Is that being too excited, too alarmist? We don't think so. Consider the fact that if and when the federal government goes into the international communications relay business via space satellites, it is already inside the industry tent, like the proverbial camel's nose. Experience with federal government ownership in the electric power business has certainly shown that one thing leads to another, and always in the same direction. The Tennessee Valley Authority started with one obsolete hydroelectric plant at Muscle Shoals, Ala., following World War I. Today, it is by far the nation's largest generator and seller of wholesale power (both hydro and steam) in the United States. Government ownership in the power field has gone from less than 5 per cent to nearly 25 per cent of all power sold during the past three decades.

Government ownership and operation of the space satellite relays would inevitably lead to a next step—a demand for "co-ordination and control" of all international communications facilities, whether by space relay, cable, or direct radio circuits. International long distance circuits must connect and do business with interstate toll lines, etc. Today, the federal government is planning a huge network of interstate power transmission lines "to co-ordinate the supply" of both public and private power plants, including those of REA co-ops. Will the day come when we will hear of similar plans for government toll lines?

The bills (S. 2890; H. R. 9907 and H. R. 10629) now before Congress by Democratic Senators Gore and Kefauver of Tennessee, Morse of Oregon, and Yarborough of Texas; and Representatives Ryan of New York and Kowalski of Connecticut have all been rightly described as measures to launch a "TVA in the Sky." These would provide for direct government ownership and operation of the proposed satellites.

What are the chances of the TVA-in-space bills? Right now they do not command a handful of

(Continued on page 49)

IN THE NATION'S CAPITAL

BY LAWRENCE J. HOGAN, WASHINGTON EDITOR
and President, Larry Hogan Associates,
Public Relations Firm.

President's "consumer interest" proposal to Congress could have important ramifications for telephone companies. Bobby Kennedy testifies in favor President's satellite communications bill. . . . Sees Congress compromise between administration proposal and Kerr Bill.

PRESIDENT Kennedy's "Special Message on Protecting the Consumer Interest" has possible important ramifications discernible between the lines for telephone companies.

The bubble of broad proposals is a master stroke of political strategy akin to pronouncements in favor of motherhood and virtue and against evil-doers and sin. It also is designed to give a grassroots push to some administration bills foundering in Congress.

The motive for the new program establishing a "White House Seal of Approval," as *National Observer* calls it, lies in the first paragraph of the President's message: Consumers . . . "are the largest economic group in the economy, affecting and affected by almost every public and private economic decision." The proposals comprise a deft maneuver to win favor with a large group of voters, particularly women.

"IF CONSUMERS are offered inferior products," the President said, "if prices are exorbitant, if drugs are unsafe or worthless, if the consumer is unable to choose on an informed basis, then his dollar is wasted, his health and safety may be threatened, and the national interest suffers."

The President pointed out that before World War II the typical supermarket stocked about 1,500 separate food items, but now it carries over 6,000. He went on to point out various problems which the shoppers must contend with. Somehow or other, we find it difficult to envision the President and Jackie pushing a wire basket cart around the aisles of a supermarket, but he sounded as if he knew what he was talking about.

He said the consumer has (1) the right to safety; (2) the right to be informed; (3) the right to choose; (4) the right to be heard.

HE RECOMMENDED beefing up the regulatory agencies and giving them more money to hire staff personnel to protect the consumers. He directed (1) that the Council of Economic Advisers create a Consumers' Advisory Council to examine and provide advice to the government on various issues as well as to serve as a voice of consumers; (2) that the head of each federal agency whose activities bear significantly on consumer welfare designate a special assistant in his office to advise and assist him in assuring adequate and effective attention to consumer interests in the work of the agency, to act as liaison with consumer and related organizations and to place increased emphasis on preparing and making available pertinent research findings for consumers in clear and useable form; and (3) that the postmaster general undertake a pilot program of displaying some of the govermnent's booklets which might be of interest to consumers.

The President concluded by saying that he hoped every agency would be alerted to the needs of consumers. "Their voice is not always as loudly heard in Washington as the voices of smaller and better organized groups —nor is their point of view always defined and presented. But under our economic as well as our political form of democracy, we share an obligation to protect the common interest in every decision we make."

ALTHOUGH THE President did not specifically mention telephone companies, it doesn't take much imagination to picture representatives of this newly spawned White House-blessed consumer lobby shaking an outraged finger at public utility commission hearings throughout the country.

The President was delivering on a campaign promise with the consumer protection message. He had intended to press for a new agency, the Office of Consumer Counsel, which would have been a pressure group for consumers before Congress and regulatory agencies, but apparently he is not anxious to lock horns with Congress on another controversial gingerbread bill which would predictably end in another bruising and deflating defeat. The approach he chose gives him an opportunity to say pious things about proposals which appeal to everyone. Is there a single voter in the country who is not a consumer?

IT ALSO ENABLES him to marshall support for some bills which are already in the legislative machinery, such as the request for authority to enable the Food and Drug Administration to pass on the effectiveness of new drugs and therapeutic devices before they are placed on the market; pretesting of cosmetics for safety; government certification of all antibiotics; consumer protection against mislabeled and deceitfully packaged products; requirement that all television set manufacturers provide for UHF as well as VHF reception.

Few will take issue with the value of most of the proposals advanced in the Kennedy message. Who can be against motherhood and virtue? The question is, "Must the Federal Government do everything for everybody?" The growing paternalism of a Federal Government with a passion for pampering its citizens will invariably result in a sapping away of individual initiative and resourcefulness. "Let-Uncle Sam do it" is becoming the philosophy, not only of individuals, lo-

cal and state governments, but even of many businessmen. The law has always been: Caveat emptor—let the buyer beware that the consumer should be protected against fraud, but not his own gullibility. The President's message is a sharp departure from this philosophy. This new "Big Fatherism" is designed to spoon feed the populace in every area of life—what it buys, what it watches on television, what subjects it studies in school, etc., etc.

JFK's Note to Khrushchev

The President has made public a letter he sent to Khrushchev regarding the possibility of cooperating with the Soviets in space exploration. The letter had five major points, one dealing with space satellite communications.

"In the field of experimental communications by satellite," the President said, "the United States has already undertaken arrangements to test and demonstrate the feasibility of intercontinental transmissions. A number of countries are constructing equipment suitable for participation in such testing. I would welcome the Soviet Union's joining in this co-operative effort. . . . I note also that Secretary Rusk has broached the subject of cooperation in this field with Minister Gromyko and that Mr. Gromyko has expressed some interest. Our technical representatives might now discuss specific possibilities in this field."

Within a short time Premier Khrushchev indicated that the Soviet Union would follow up the suggestion for Soviet-American cooperation. Khrushchev said that such cooperation could be of specific value in the area of earth satellites for "super long-distance" communications.

Preliminary talks are scheduled to begin on Mar. 27 between Dr. Hugh L. Dryden, deputy director of the National Aeronautics and Space Administration and A. A. Blagonravov a Soviet academician. The proposals for cooperation in the exploration and use of space have received wide congressional approval and one legislator has noted that an agreement of this type could turn outer space into a laboratory rather than a battlefield.

Satellite Hearings Go On

Attorney General Robert F. Kennedy testified before the House Interstate Commerce Committee that work on a communications satellite system is so advanced that a key decision on its ownership must be made very shortly. He predicted that the first system of satellites to transmit messages "will be placed in the skies" next year. He emphasized that the administration feels all Americans should be allowed to invest in the corporation owning the system and said that if the ownership is restricted to communications companies the satellite corporation might slip into domination by American Telephone & Telegraph Co. *(See Editorial on page 19 and article by R. O. Beck on page 22.)*

HE POINTED out that the system will be used by the government as well as by private carriers. Through government-financed research, Mr. Kennedy said, the taxpayers of the United States already have invested $175 million in development of the system, and they should be allowed to reap the benefits of this investment by buying stock in the new satellite corporation and sharing in its profits.

It should be pointed out that the State and Justice Departments stand almost alone in their wholehearted support of the administration's bill to launch a satellite relay system with a government-controlled corporation selling two classes of stock—one to the public and one to the participating carriers. The FCC was opposed to it and so was the Communications Workers of America. The Defense Department was neutral and so was NASA. The impression prevails that Brother Bobby was sent in at the last of the hearings to bolster the chances of the sagging administration bill.

INDICATIONS are that the Senate Space Committee might go along with the President's proposal for joint ownership of the satellite corporation between the general public and overseas communications companies, but with substantial alterations which would insure a strong voice for the companies.

The committee members voted not to replace the administration bill with Chairman Kerr's own bill which would restrict ownership to the communications companies, but they're far from happy with the White House bill. A committee vote is expected any time on amendments to the administration bill (which would make it the compromise measure which this department has predicted).

ONE MAIN CHANGE would call for only one class of stock instead of the "A" and "B" classes in the President's bill. Sixty per cent of this stock would be held by communications companies and 40 per cent by the public. The price of $1,000 per share would be reduced to $100 to broaden public appeal. One change calls for a board of directors with six representatives of the communications companies, six from the public and one appointed by the White House. This would not give the companies control (as they would have under the Kerr bill), but would give them a much louder voice than they would be accorded under the President's bill.

The Committee's compromise plan would also simplify government regulation of the system. The legislators were irked by what they considered too prominent a role for the striped pants boys—so the amendments probably will call for mere assistance by the State Department when deemed necessary, rather than the authorization to supervise negotiations with foreign governments or companies which is provided in the President's proposal.

NASA, WHICH would oversee the system's technical aspects under the administration bill would not have this responsibility under the Senate committee's plan, but would merely be responsible for providing the launching hardware for getting the satellites into orbit. The corporation would pay NASA for this service. Either the corporation or companies could own the ground stations under the Senate committee's plan. The President's bill, while allowing the corporation to own the ground stations, fails to mention ownership by the companies.

After concluding its hearings, the House committee will begin haggling over its own amendments, but the upper and lower chambers are apparently not far apart in their views, so it shouldn't be difficult to iron out differences between their respective bills after they are passed. It's a pretty safe bet that we will see a satellite communications bill enacted this session.

FCC Won't Get Home of Its Own

Ever since its establishment in 1934, FCC has been a "boarder" in other agencies' office space. Its headquarters are in the Post Office Building, but its staff is dispersed throughout the city in other sites as well. It occupies 163,000 square feet of space and by 1970 will require an estimated 200,000 square feet. About a month ago, a committee of the Agency's "friends" formed a committee representing engineers, lawyers, broadcasters, telephone companies and trade associations called by the Federal Communications Bar Association to create pressure for a permanent FCC headquarters building. General Services Administrator Bernard L. Boutin has now announced new housing plans for the agency, but not a new headquarters building.

The old Washington *Evening Star* Building at Eleventh Street and Pennsylvania Avenue, Northwest, which the newspaper vacated and sold when

(Continued on page 50)

ABOUT SPACE COMMUNICATIONS

By RALPH O. BECK*

PART I

UNTIL THE LAST few years space was a vast expanse of the unknown. Now our scientific knowledge and progress in this area are moving at an accelerated pace.

One phase of the fast evolving developments is that of communications via satellites. Volumes have been written about proposals to set up a corporation to develop, construct, operate, manage and promote the use of space satellite communications for United States interests. Despite this, an aura of mystery surrounds the general subject. This seems to be particularly true within the Independent telephone industry.

To many people, the potentials in space seem too far off to be real. Accomplishments thus far, and those in the offing, are more like something out of a Jules Verne book or a popular science-fiction magazine.

Satellite Communications Here!

Considerable research already has been conducted in space communications. Before the end of this year experimental communication satellites will be orbiting the earth. Basically, communication by satellites is here. We are now in the stage of testing and refining techniques to make this system economically feasible and practical.

Many otherwise well-informed people in the Independent telephone industry seem to feel that this subject is the sole concern of the international common carriers. Some feel that it is of no concern to them because their operations are confined to short-haul traffic. Others "haven't had time" to inform themselves and are content to "let George do it" until space communications becomes the popular fashion.

No expert will hazard a guess as to the ultimate use of communication satellites. Already there has been some talk of using the new system for calls of less than transoceanic distances—say between two points within the United States.

Everyone's Concern

This series of articles is intended to give a current view of the satellite communications picture. It proposes to use understandable language to provoke people in telephone management to think about the subject and to realize that everyone in the industry should be vitally concerned about proposals to organize and operate a satellite communications corporation.

Congressional committees are considering legislative proposals for such a corporation which vary from the extremes of a Tennessee Valley Authority type of organization—a "TVA In The Sky"—to a continuation of our private enterprise system in the communications field.

R. O. BECK

Congress could pass a bill providing for government ownership and start the decline of private ownership and initiative in U. S. communications. Or, it could give the "go" signal permitting our privately owned companies to proceed at the earliest time through a corporation designed to best represent American interests in a worldwide joint venture in this field.

Space communications have been discussed generally in the last few years. Practical attention was focused on this subject in March of last year when the Federal Communications Commission began an inquiry into certain administrative and regulatory problems involved in the authorization of a communications satellite system.

FCC Report

The FCC released a report on May 24, 1961, based on responses it had obtained from companies in the communications field. In effect, the report recommended the formation of a joint venture composed of U. S. international common carriers as a means of promoting the orderly development of an effective system.

Two months later, on July 24, President Kennedy issued a statement on a communications satellite policy. In it, the President said communications satellites should be developed under the leadership of the United States for global benefit at the earliest practical time. He declared that it was in the public interest that increased resources be devoted to the task of coordinating national policy in this respect.

The President invited all nations to participate in this system in the interest of world peace and closer brotherhood among peoples of the earth. He set forth the policy that private ownership and operation of the U. S. portion of the satellite system is favored, provided that such owner-

*This is the first of a series of articles by Mr. Beck, who is Vice President of Hawaiian Telephone Co. of Honolulu. He represented his company on the FCC Ad Hoc Carrier Committee, composed of 10 U.S. international common carriers, to study establishment of satellite communications system.

ship and operation meet certain policy requirements. He also outlined a policy of governmental responsibility that would aid regularly established governmental regulatory responsibilities.

Ad Hoc Committee Formed

The FCC promptly followed this White House message with the formation of an *Ad Hoc*[1] Carrier Committee, by inviting representatives of 10 U. S. international common carriers to participate as members of this committee. These companies were: American Cable & Radio Corp., American Telephone & Telegraph Co., Hawaiian Telephone Co., Press Wireless, Inc., Radio Corp. of Puerto Rico, RCA Communications, Inc., South Puerto Rico Sugar Corp., Tropical Radio Telegraph Co., United States-Liberia Radio Corp., and the Western Union Telegraph Co.

All of these companies indicated a willingness to participate in these discussions and did so, except for the United States-Liberia Radio Corp.

The meetings of the FCC *Ad Hoc* Carrier Committee were held in New York and to a lesser extent, Washington, D. C. Over 75 meetings were held by various groups of these companies, commencing Aug. 15, 1961, and continuing until the report was filed with the FCC on Oct. 13.

The discussions were interesting, informative, and actually were policy making meetings on the subject of space communications. For the first time in business history, a group of communication companies' representatives endeavored to describe how the United States could be a part of a world-wide joint venture organized for the purpose of using space as a communications medium. All meetings were held in the presence of FCC officials who acted as presiding officers. This was one of the ground rules followed to meet President Kennedy's policy considerations, and also at the insistence of the U. S. Department of Justice. The latter was interested in these discussions because of any possible anti-trust implications.

Appeared Before Committee

Scientists from Bell Laboratories, as well as from RCA Laboratories, made presentations to the committee, as did representatives of various aero-space manufacturers such as Lockheed and General Electric. Appearances were made by such government organizations as the State Department, Department of Defense, National Aeronautics & Space Administration, Department of Commerce, Office of Civil Defense Mobilization, and the Maritime Administration.

The technique suggested for use with space satellites is not new to the communications industry. It is merely the use of microwave radio with a repeater in the satellite to boost the signal back to earth. Microwaves do not bend with the curvature of the earth, so they are used on a "line of sight" basis only. Satellites are therefore ideal for this method.

The use of a medium altitude space satellite system was discussed, as was use of a high altitude synchronous system. These matters and similar decisions were left by the participants in the *Ad Hoc* Committee Report to a suggested board of directors of the American portion of the world-wide satellite system.

Estimated Capital Cost Parameters

The *Ad Hoc* report indicated that the initial investment required to establish an operable communications satellite system couldn't be stated previously at the time the report was written. The report did state that "estimated capital cost parameters for various configurations of satellites are as follows:

Configuration	Cost[2] ($ million)
(a) 20 medium-altitude satellites in random polar orbit	45 to 94
(b) Two pairs of satellites in synchronous orbit	50 to 100
(c) Configuration (a) plus 10 medium-altitude satellites in random equatorial orbit	67 to 141
(d) Three pairs of satellites in synchronous orbit	75 to 150

"These estimates do not include the cost of ground stations, replacing satellites or otherwise maintaining a going system.

"General cost parameters for the construction of ground stations range from 6.5 to 9 million dollars for each ground station serving heavy traffic areas in a medium-altitude system (plus 7 million dollars for an associated tracking station to serve the system) and 2.5 to 3 million dollars for each ground station serving a high-altitude system. On this basis, capital costs to establish ground stations (not including annual operating, maintenance and replacement costs) to serve initially 10 points—for example, east and west coasts of the continental United States and in Hawaii, and seven foreign countries—by medium and/or high-altitude satellites would be as follows:

	U.S. inc. Hawaii ($ million)	Other Countries ($ million)
"(a) For medium-altitude satellites including tracking station	26.5 to 34	45.5 to 63
"(b) For high-altitude satellites	6.5 to 9	17.5 to 21"

While this variation might seem quite wide, it was a means of suggesting that various systems could be considered by the satellite corporation board of directors, and the one actually selected would depend to a great extent on the funds made available for the purpose of operating the satellite system.

Five Pledge Funds

Of the companies signing the report, five pledged funds to the venture. American Telephone & Telegraph committed 50 million dollars and indicated that if more funds were needed an additional 15 million dollars would be made available by them. American Cable & Radio Corp. (an IT&T subsidiary) committed 5 million dollars, Hawaiian Telephone Company, 2 million dollars, Radio Corp. of Puerto Rico $800,000 and Western Union, 5 million dollars.

The door is open, however, for other American communication companies to join with these companies in the organization of a communication satel-

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1 **Ad Hoc** is defined as a group organized solely for one purpose.

2 "Medium-altitude satellites are estimated to cost $450,000 to $600,000 each and high-altitude satellites from one million to 2 million dollars each. Rockets for launching satellites will probably range from 9.5 million dollars for the Atlas-Agena B to 10.5 million dollars for the Atlas-Centaur or modified Atlas-Agena. These costs include 1 million dollars for use of a launching pad, launch tracking and associated costs. It has been assumed that the Atlas-Agena B would have an 80 per cent probability of success in launching three medium-altitude satellites and the Atlas-Centaur would have a 66-2/3 per cent probability of success in launching 10 medium-altitude satellites. It is estimated that a modified Atlas-Agena B would have a 50 per cent probability of success in launching high-altitude satellites. The cost per satellite in space would also depend upon the number of satellites that could be launched with a single rocket. This could vary from one to two satellites per launch for the high-altitude system and three to 10 satellites per launch for the medium-altitude system."

BEAT COMPETITION

Minnesotans Urged

By R. C. RENO

ELEVEN HUNDRED telephone men and women from Minnesota and surrounding states defied heavy snow and below zero weather to attend the 53rd annual convention of the Minnesota Telephone Association, held Feb. 25, 26, 27 and 28 in Minneapolis.

The theme of the convention was "The Industry Faces Competition," and this subject was emphasized by various speakers, along with need for telephone companies to take aggressive steps to expand and sell their services to the public to meet the growing competition being offered by outside manufacturers and suppliers of communications facilities.

Drop in Independents

There are 16 fewer operating telephone companies in Minnesota today than there were a year ago, Kenneth P. Ellefson, president of Minnesota association, stated in his report which formally opened the convention. Mr. Ellefson is general manager of the Norman County Telephone Co. at Ada, Minn.

"These companies were sold, merged or consolidated, thus showing the trend towards growth of larger operating groups to meet economic pressure, efficiency and a higher quality of service," he said.

Pointing out that there were 246 operating telephone companies in Minnesota in 1950 and only 192 today, Mr. Ellefson said that "undoubtedly as time goes on more and more of the small companies will join larger groups in order to attract financing for providing efficiency."

"We hear and read all sorts of theories on the disappearing small company. However, we know that for years we will continue to have small companies and good small companies. With good management, help from manufacturers, continued cooperation of the Bell System, and a strong healthy desire, we will not be swallowed up by the larger units and will continue to contribute to this growing industry."

Mr. Ellefson said that subscribers are demanding and willing to pay for modern telephone service "and this gives us the incentive and the backing to continue with our programs of improvements."

"The day of the 10 to 20-party rural line is over. The eight-party rural line is being replaced by the five-party line, and even one-party lines with a mileaged rate. Buried cable plant is becoming more common in the rural areas to insure all-weather operation," he observed.

He said that with the coming of dial service to a small exchange also comes the demand for extra services such as the color telephones, extensions, Call Directors, mobile dial telephone service, home and farm interphone systems, and extended area service.

Quality Service Counts

"This is what the subscriber wants. He is interested in quality and is willing to pay a fair price for such service. Management has a terrific responsibility to keep itself current of these changes and be able to meet them. However, the small company is limited to what it can do when revenues are insufficient because of size: it simply does not have enough operating money available to pay for all that is necessary to maintain a telephone system today.

"The increases in growth, the need to continue to improve quality of service, increases in expenses, and higher over-all per station investment can lead to only one thing—upward adjustment in telephone rates. Each company has an obligation to remain financially strong . . . so as to attract investments

Officers and directors of the Minnesota Telephone Association. Standing, left to right: A. E. Lindekugel, Central Telephone Co., of Fairmont; Kenneth M. Peterson, KMP Telephone Co. of Kerkhoven; H. James Boyd, Alexandria Telephone Co.; John L. Hinrichsen, Pioneer Telephone Co. of Waconia; Robert W. Bunke, Ace Telephone Co. of Houston; Glenn J. Dwelle, Lake City Telephone Co.; Herbert J. Lien, Blackduck Telephone Co.; Steve Halvorson, Minnesota Telephone Co. of International Falls; James E. Olson, Northwestern Bell Telephone Co. of Minneapolis; Harold W. Peterson, Garden Valley Telephone Co. of Erskine; John G. Holland, New Ulm Rural Telephone Co. Seated, left to right: Vies Martinsen, Home Telephone Co. of Grand Meadow; Charles Cashel, Worthington Telephone Co.; P. M. Ferguson, Jr., Mankato Citizens Telephone Co.; Kenneth P. Ellefson, Norman County Telephone Co. of Ada, and Keith W. Vogt, St. Paul, association secretary-treasurer.

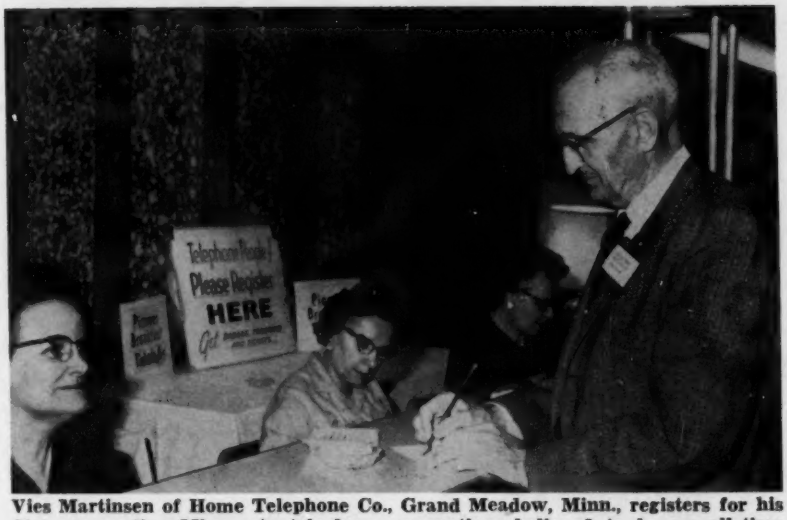
to allow itself to grow and keep up with the future," Mr. Ellefson concluded.

Clapp Sounds Warning

REA Administrator Norman M. Clapp, addressing the convention, stressed the importance of local ownership of telephone systems in carrying out the objectives of the REA telephone loan program.

At the same time he warned the Independent telephone industry that it is in "deep trouble" if get-rich-quick speculators move in on small telephone companies and "are permitted to fashion a blue-sky type of financial pyramid out of token equities."

He said that he would "find it hard to justify an REA loan to an operating company controlled by a holding company which seems to have plenty of money from public and other sources to buy additional properties at inflated prices."



Vies Martinsen of Home Telephone Co., Grand Meadow, Minn., registers for his 41st consecutive Minnesota telephone convention—believed to be an all-time record of perfect attendance. His registration is accepted by (left) Miss Helen Simonsen, veteran secretary in the Minnesota Telephone Association office in St. Paul. Mr. Martinsen is a past president of the association and serves on its board of directors.

Total Community Service

Mr. Clapp said that his agency has "no quarrel with any telephone company which is working toward the objectives of total community service," but he added this warning:

"The very nature of the telephone business as a growth industry, enjoying an assured rate of return on a high capital investment—with only a low equity required for control—is attractive to the get-rich-quick speculator who would promote his own selfish interests at the expense of your industry's high standing, the welfare of the local community, and the objectives of the REA telephone program."

Admitting that there are no infallible rules for predicting what kind of telephone organization is going to give the best community service, Mr. Clapp said that the locally-owned ones are not all good, nor are the large investor-owned companies all bad. But he said that "the broader the base of local ownership, the greater importance is likely to be attached to good service as a primary management objective."

Discusses Local Ownership

"The more we look at the REA telephone program," Mr. Clapp said, "the more we appreciate the part which local ownership has played in carrying out the objectives of the program. Whether it is a cooperative, owned by all its subscriber-members, a family firm, or a stock corporation whose shareholders live in the community which the company serves, we believe that local ownership will be most responsive and responsible in meeting community needs. A telephone company which is a part of the community, not apart from it, is much more likely to do the job that REA was assigned to assist."

The REA administrator said there is "a trend toward larger companies and a growing concentration of local telephone companies into satellite systems building around various holding companies." Along with this trend, he added, "we find a rise in the potential for speculation in stock ownership of small telephone companies."

Concern Over Speculation

He said that many industry representatives share REA's concern over the growing tide of speculation. "My own mail at REA," Mr. Clapp said, "indicates that an increasing number of our borrowers are concerned with the image of the telephone industry itself as the telephone franchise becomes a pawn in a mad scramble of financial promoters to acquire the locally-owned companies."

REA loans, he said, "are to provide better service for rural areas on an area coverage basis, not to make profits for the owners. There are and will be reasonable profits from accomplishing these objectives, but these are incidental, not the objective of 2 per cent REA loans."

Dr. N. M. Mensheha of Minneapolis, a clinical research fellow at the University of Minnesota, spoke on "The Imminent Danger of Communism to the American Way of Life."

Born, raised and educated in Russia before he came to the United States in 1949, Dr. Mensheha warned that America has no effective plan to combat communism.

Must Explain Communism

"We do not teach our youngsters about communism so that they may compare the communist ideology with the principles of the American way of life. We do not use adequately our communicative media like the press, radio and television to expose the communist aims and the communist methods. I have not seen a single story yet of Russian atrocities committed in Russia during their 45 years of power, of those being committed now in enslaved countries, or those depicting the subversive activity of Russian agents all over the world.

"Many people in this country think that communism is just another ideology which in due time will be transformed into one or another form of democracy . . . These people simply do not understand the fact that communism has not changed in its nature and only the methods of communism may change according to times and existing conditions," Dr. Mensheha said.

DDD Completion Fast

The average long distance telephone call today goes through in just 60 seconds, compared to 2¼ minutes in 1943, and on Direct Distance Dialing calls, the average time has been cut to 40 seconds, Stanley S. Boylls of Kansas City, Mo., western area traffic man-

ager of American Telephone & Telegraph Co. Long Lines Department, pointed out in an address on "Customer Service and DDD".

Mr. Boylls said that 37 per cent of the more than 100 million long distance calls handled by AT&T for Bell companies are now on a DDD basis.

"The speed-up in handling long distance calls has even resulted in cutting down to 60 seconds the average connecting time to Alaska and Hawaii, where operators must still place the calls," he said. Traffic to those two new states, incidentally, has sharply increased in recent years since cables were installed," he stated.

Mr. Boylls reported that in Minnesota more than 600,000 telephone users can now originate DDD calls, while 900,000 telephones in more than 400 Minnesota communities are equipped to receive them.

Competition Growing

Telephone companies must aggressively find ways to serve the public if they are to maintain their traditional position of leadership in the field of communications, Paul W. Gaillard of Omaha, Neb., vice president in charge of military and governmental services of Northwestern Bell Telephone Co., told the convention.

"We must no longer think of ourselves purely as telephone companies,

Photographed at the Minnesota convention are P. M. Ferguson, Jr., (left) Mankato Citizens Telephone Co., Mankato, Minn. (new president of Minnesota Telephone Association, Inc.) and A. J. Stults of TELEPHONY.

but as communications companies," he said in an address entitled "Competition, Challenge and Change." He held that the way to head off growing competition by outside sources is "to go after new business, especially the business with most potential.

"The railroads began to slip when they persisted in offering only railroad service, while the customers were demanding transportation service. The same thing almost happened to the motion picture industry when it became too interested in the production of movies and failed to see the need for broad-scale entertainment to meet the public's tastes," he said.

Big Selling Job Ahead

Mr. Gaillard pointed out that families buy a second car or a second television set quite willingly, but give less thought to adding a second telephone or extension.

"It shows what a selling job we have to do when 50 per cent of the teen-agers have their own radios or phonographs, but only 7 per cent have their own personal telephone," he pointed out.

Mr. Gaillard offered as evidence of what telephone companies can do, an experimental night long distance telephone "package" offered by his company at Waterloo, Ia., where, for only $10 a month, a subscriber can place long distance calls any place in Iowa anytime he wants to after 9 p.m.—and talk as long as he desires.

"The plan was an instantaneous success, and has been ever since it was introduced. With the cost of telephone plant being what it is today, we must find methods like this to keep our facilities working round-the-clock and bringing in revenue," he said.

Mr. Gaillard offered this five-point program for the telephone industry:

(1) Improve the quality of telephone service; (2) improve the industry's marketing ability; (3) provide a larger variety of service; (4) plan for future expansion of business and be equipped to handle it; (5) pull together as a total industry—Independent companies, Bell, and suppliers and manufacturers of equipment.

"We can no longer be order-takers. We must go out and serve the customer with the products he wants," Mr. Gaillard concluded.

Business Demands Knowledge

Delegates heard another discussion of salesmanship from Dr. Carl S. Winters, of Oak Park, Ill. A consultant to General Motors, Dr. Winters titled his talk "Information, Inspiration and Perspiration in Selling".

"Knowledge is 'king' in many areas," Dr. Winters said. "To have a kindergarten mind in an adult body in the atomic age is a supreme crime. We have to know a lot to stay alive today and we have to know more to stay in business.

"The successful salesman will have

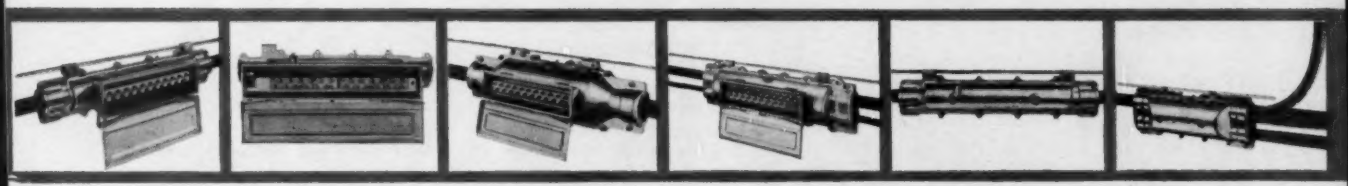
(Continued on page 46)

This threesome attending the Minnesota convention are, left to right: Donald Johnson, Pineland Telephone Co., McGregor, Minn.; Dick Johnson, Dickey Rural Mutual Aid Corp., Ellendale, S. D., and Parker L. Kidder, Northwestern Bell Telephone Co., Minneapolis.

NO IT ISN'T A SUBMARINE...

It's a Reliable Splice Case

for use with Lead, Alpeth, PIC, Aluminum and Stalpeth sheathed cables



This line of 48 Splice Cases and Splice Case Terminals is available in straight-thru or multiple styles, 11 pair to 32 pair combinations, for aerial and cable vault installations. The four basic Splice Case sizes are determined by the outside diameter of your cable:

A size for cable .3" to 1.0" O.D.
B size for cable 1.0" to 1.6" O.D.
C size for cable 1.6" to 2.2" O.D.
D size for cable 2.2" to 2.9" O.D.

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Bell To Carry Out "Telstar" Experiment This Year

DURING 1962 THE Bell System plans to carry out a series of experiments in the use of space satellites for relaying microwave radio signals over long distances. Bell Telephone Laboratories is responsible for the design, construction and experimental operation of the satellites and ground stations. The National Aeronautics & Space Administration will launch the satellites under a cooperative agreement with the American Telephone & Telegraph Co.

The feasibility of communication by satellite was demonstrated by the National Aeronautics & Space Administration's Project Echo, in August, 1960, in which Bell Laboratories was a participant, and also by projects Courier and Score. The upcoming project, named "Telstar," will be another step toward the goal of establishing an operating world-wide system using satellites with microwave radio.

"MICROWAVE" radio, as most telephone men know, refers to very short wave, high frequency radio, billions of cycles per second. These frequencies are capable of carrying a great deal of information but, unlike lower frequency signals, usually travel only in straight lines and do not bend around the earth's surface.

The most recent Bell System microwave relay equipment is capable of carrying 11,000 simultaneous telephone conversations. These systems work by relaying the straight-line signals relatively short distances from tower to tower, and thus around the curved surface of the earth.

It is not feasible to build a line of towers across the oceans, so overseas communications are now carried by cables and radio-telephone. But a satellite at several thousand miles altitude or more can provide a path of straight lines between very distant places as long as the satellite is above the horizon at both places. A system of satellites operating in this manner could provide continuous service and greatly augment present facilities for world-wide communications.

DURING THE Telstar experiments a microwave signal will be beamed from a ground station at Andover, Me., to the satellite. The satellite "repeater" will pick up the signal, amplify it, and retransmit it on a different frequency.

In a room lined with pyramids of foam plastic that absorbs radio energy, Charles A. Haas, Bell Telephone Laboratories engineer, inspects a model of the Telstar experimental communications satellite. The chamber simulates the radio environment of space so that engineers can test the antennas. Broadband transmitting and receiving antennas girdle the satellite while a beacon antenna is on top. Patches of solar cells on the shell of the satellite convert sunlight into electricity to provide power.

The Andover ground station will also be equipped to receive the satellite transmission. In addition, a second ground station at Holmdel, N. J. will pick up the retransmitted signal, thus completing the communication between two distant points on earth if all goes well.

The Echo project involved the transmission of only one two-way telephone conversation at any one time. The Telstar project aims to transmit a broadband signal capable of carrying many voice or data channels, or alternatively, a single live television signal. Television transmission normally requires the same radio bandwidth as is needed for 500 to 1000 voice channels.

The first Telstar experimental satellite and the associated ground stations will have the capability of transmitting 600 voice channels, or one television signal, one way. While the first experimental satellite is not primarily designed for two-way telephony, the system could provide for 60 simultaneous two-way telephone conversations. Tests will be made to confirm this, but as a practical matter the ground station will have "multiplexing" equipment sufficient to carry only 12 two-way conversations at any one time.

THE EXPERIMENT is intended to advance the entire art of communication by satellite. Major objectives of the program are to:

(1) Test actual broadband communication by satellite.
(2) Test the reliability of the electronic equipment on board the satellite in the strenuous working environment of space and launch.
(3) Provide a real-life test of the operation of ground station equipment.
(4) Provide additional knowledge about the best techniques for tracking a moving satellite extremely accurately.
(5) Provide needed scientific measurements of radiation in space.

The Telstar project also includes construction of new facilities to be used in the experiments with satellites. Involved in the project are about 400 scientists, engineers and technicians of Bell Laboratories; 20 at AT&T headquarters; 15 in the Long Lines Department of AT&T; 105 in Western Electric; and 46 in the New England Telephone & Telegraph Co. In addition, more than 800 other firms, three-fourths of them small businesses, have contracted to furnish equipment or service.

Major steps to achieve the objectives of the program are:

(1) The design and building of experimental satellites including design, development and testing of components specific to satellite requirements.
(2) The design and construction of a large ground antenna, transmitting and receiving equipment, tracking and control facilities. The site of this ground station is a hilltop—"Space Hill"—at Andover, Me. The satellite communication station will be tied to the existing nationwide communications network by a special microwave relay system installed by Long Lines.
(3) Adaptation of the Holmdel, N. J., station—"the first telephone terminal to outer space," used in the the Echo experiments—to receive Telstar's beacon and signals.
(4) The design, construction and

(Continued on page 45)

TELEPHONY'S ELECTRONICS SECTION

BY PAUL E. MURPHY, ELECTRONICS EDITOR

MICROWAVE SYSTEM DEVELOPMENTS

THE USE OF microwave to provide the medium over which large-density multiplexing systems and television channels have been superimposed is nothing new to the telephone industry. Neither is the fact, in general, costs have, for the most part, ruled out its practical aspects for short-haul usage.

In a previous article (TELEPHONY, July 30, 1960), a discussion was presented on the development of a "short-haul" microwave system as the result of an experiment being conducted by the Radio Research Laboratory of Bell Telephone Laboratories.

The basic concept of the research has led to the development of the Bell System's new TL system with departures from the concept as economic advantages.

An article by U. S. Berger, recently published in the Bell "Laboratories Record", described the development and components of the new TL system.

As was pointed out, the major advantages of the basic concept are low system costs, simplified installation, and minimum maintenance, the only means of proving in a short-haul microwave system.

The TL microwave system has been designed to operate in the 10,700 MC to 11,700 MC common carrier band as were the basic experiment concepts reviewed in the earlier issue of TELEPHONY.

Mr. Berger explained that all the radio, power and auxiliary equipment for a terminal is housed in a single cabinet for a non-diversity terminal. A second cabinet is thus necessary for a repeater point. He also pointed out that equipment necessary to translate several N or ON carrier multiplex systems could likewise be installed in these same TL housings. Channelizing equipment would, however, normally be located at the telephone company central office. The cabinet, as shown in the accompanying illustration, is mounted on struts supported by two poles used also to support antenna elements.

Mr. Berger explained that in order to install the radio equipment indoors, where desirable, the equipment has been designed for conventional rack mounting, requiring only a 7 or 9-foot rack for mounting essentially all the equipment normally contained in the outdoor housing.

While explaining the basic advantages and features of the low-cost microwave system, Mr. Berger pointed-out, "since the system uses

TL microwave repeater station housing is a package containing all necessary batteries, microwave radio, and auxiliary equipment.

primarily solid-state devices, its power requirements are much lower than other systems operating in the same band." It can be operated with common lead-acid storage batteries for standby emergency power, eliminating the need for an engine alternator.

In discussing power, it was explained that the batteries are on charge from 115 volts ac commercial power and upon failure of the commercial power, standby operation from the batteries can be provided from 12 to 24 hours. The storage batteries consist of four six-volt units and are housed within the cabinet. For extended power outages, Mr. Berger explained, "provision is made for an external connection to a portable engine driven alternator. . . . Transistorized dc/dc convertors are utilized to provide higher voltages for operation of the transmitter and receiver klystrons and six volts for energizing heaters."

Mr. Berger pointed out that many features of the TL radio equipment are similar to the TJ system operating in the same band. It was explained that many important differences do exist, however.

Of particular interest was that of maintaining frequency stability in the transmitter and receiver circuitry.

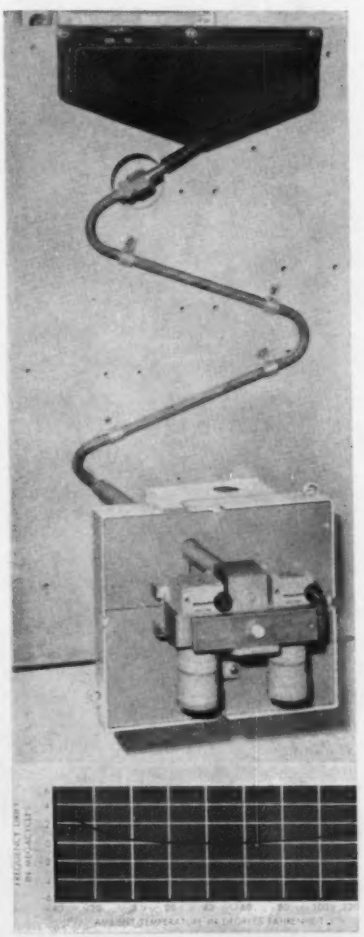
"For example, the TL transmitting and receiving oscillators use a new 11,000 mc klystron tube, coded the 457A. To maintain the desired frequency stability, a vapor-phase cooling system . . . maintains the temperature within the klystron housing nearly constant over a wide range of ambient conditions. The klystrons are clamped to a small hollow boiler partially filled with a low boiling (214 degrees F.) fluorochemical liquid. When the tube and boiler reach this temperature, some of the liquid boils and the vapor passes out into the cooling system. There it condenses and runs back into the boiler, keeping the temperature relatively constant. A rubber bag is used as an expansion chamber to permit volume changes without significant pressure changes."

It was explained that no AFC (Automatic Frequency Control) is required at the transmitter, due to the relative constant temperature of the klystrons. However, in order to maintain the signal at the center of the intermediate frequency (IF) band, use is made of AFC.

In accordance with the basic concept, the entire TL system uses primarily solid state devices and other recently developed devices and circuitry. The receiver, for example, incorporates a transistorized IF amplifier with wide-bandwidth ferrite transformers. These transformers provide the coupling between transistor stages, and with an impedance ratio of 4:1, give about 5 db gain per stage. A total of 27 transistors and 23 transformers provide the required 110 db of IF gain. Two diode variolossers, placed between sections of the amplifier, furnish automatic gain control.

In order to provide suitable AFC at the receiver, Mr. Berger explained that, "an error signal is derived from the discriminator and applied to the control winding of a magnetic amplifier through a dc amplifier." The magnetic amplifier output is detected, and dc is applied to the repeller of the receiving klystron oscillator to adjust the difference frequency between the incoming signal and the oscillator to 70 mc, the IF frequency.

Another feature of the system is said to include a simplified order wire and alarm system. The order wire and alarm system is designed to operate from about 200 to 3,000 cps. within the baseband while multiplex frequencies use that por-



As klystrons in lower part of photo heat up, low-boiling liquid in square boiler vaporizes and rises into heat exchanger tube. The constant temperature prevents frequency shift, as shown in graph.

tion of the baseband above about 10 kilocycles.

Where greater reliability is desired a diversity type system may be installed. The diversity switch is accomplished through logic based upon the presence or absence of a 2,600 cps tone in the baseband and upon strength of the received signal.

(Frequency diversity equipment makes use of two transmitters operating on two different frequencies and transmitting the same intelligence. Distant receivers associated with each of the transmitters "pick up" these signals. Logic circuitory determines the output of the desired receiver to be passed on to another transmitter at a repeater station or to multiplex equipment at a terminal or "drop-out").

Thus, diversity serves to improve reliability in the face of fading or equipment failures. "In the case of equipment failure, the switch operates in less than 35 milliseconds," Mr. Berger stated, "while during a condition of fade . . . . the no-hit diversity switch instantaneously operates through the other receiver."

Antenna systems may consist of anyone of a number of arrangements. Standard 5 or 10-foot parabolas may be used, as now used with existing TJ systems and may be used independently or in association with reflectors atop a tower, depending upon line-of-sight conditions.

The simplest and most inexpensive type of antenna mounting is the woodpole "H" structure. The design is adequate for up to 60 feet, with either direct radiating antennas . . . . or with 6 x 8 foot reflectors. For those installations where a steel tower is preferred, or where heights greater than 60 feet are needed, a new series of lightweight, guyed and self-supporting towers has been developed. These towers, designated Type C, have been designed to withstand wind loads of 30 pounds per square foot, in heights from 60 to 105 feet. It was also pointed out that for greater heights (to 300 feet) the Type B tower for use with the TJ system can be used.

Mr. Berger, in his article, summarized a number of performance specifications and were given as listed below:

Frequency Range: 10,700-11,700 mc.
No. of Radio Channels: 6 (each direction).
No. of Hops in Tandem: 10 maximum per alarm section.
Transmitting Power: 1 watt (+20 dbm).
Receiver Noise Figure: less than 15 db at —35 dbm.
Normal Fading Margin: 40 db.
Normal Receiver Input: —35 to —45 dbm.
System Bandwidth, 1 Hop: 200 cps to 6 mc.
Carrier Frequency Noise (7.5 kc —5 mc): 62 db below full deviation (unweighted, 1 hop).
Order-wire Noise: 45 dba at 0 db transmission level, 10 hops.
Primary Power Input: 170 watts per terminal.
Antenna Gain (Typical): 42 db (5-ft. antenna and 6X8 reflector).
Diversity Operation: Optional.
Baseband Stability: ±.2 db per repeater section.

A number of types of frequency division multiplex can be used on the TL system, such as the Western Electric Co., N, ON, and L carrier multiplexing equipment. "At least 48 channels of N and up to 96 channels of ON can be used, and performance tests on early models of the radio equipment indicate that more than 240 channels of L multiplex (single-sideband suppressed carrier) meet system objectives for 10 radio repeater hops," Mr. Berger said.

Repeater stations, in most areas, will normally be spaced 15 to 20 miles apart. In areas where heavy rainfall is prevalent, repeater spacings may have to be reduced; conversely in very arid regions, distances can be increased. On long spans, where maximum reliability and circuit continuity is desired, diversity operation fulfills this need as described previously.

Ease of installation, low maintenance, time savings in ordering and engineering, and many other features are certain to make the TL system a major tool for short-haul telephone applications.

TRANS-ATLANTIC SERVICE EXPANDED

THE AMERICAN Cable & Radio Corp., a subsidiary of International Telephone & Telegraph Corp., recently announced expansion of its transatlantic telegraphic service.

B. B. Tower, president of American Cable & Radio, called the broadened service "another step in a modernization program that in less than two years has greatly increased our transatlantic cable capacity. These telegraph channels in modern coaxial cables make it possible for us to provide the public with vastly improved service."

Mr. Tower pointed out that the increase in capacity was authorized by the Federal Communications Commission, which recently approved a proposal submitted by one of AC&R's operating units, to lease facilities in a new completed coaxial cable between Canada, the United Kingdom, and Europe. The cable, known as CANTAT, is jointly owned by the British Post Office

and Canadian Overseas Telecommunication Corp.

The use of the cable is said to permit an additional 44 channels and an over-all capacity of 97 channels.

CARRIER TECHNIQUES

TELEPHONY's Electronics Section (Feb. 24, 1962) discussed a new development in transistorized cable carrier. The new system was designed by Panhandle Electric Sales Co. to be compatible with the Bell System's "N" system. The new system could be and is operated "end-to-end" with an "N" terminal. The system was designated "LN".

There has been considerable interest expressed among many Independent telephone companies in the new development. Potentially, it may represent a considerable savings in space and equipment costs as was discussed in the recent article.

Inquiries have been made as to the actual performance of the carrier system, specifically the drop-to-drop frequency response. Fig. 1 depicts the specifications given by the manufacturer for "LN" terminals back-to-back as well as typical actual measurements performed on the Galena to Columbus, O., systems. The "N" terminals are located at Columbus, while "LN" terminals are located at Galena. Identical system arrangements have been installed between Sunbury and Columbus. Response characteristics for these systems are very similar to those illustrated in Fig. 1.

Services established over the Sunbury and Galena to Columbus systems include foreign exchange service, full period service, FAA special services, EAS, and toll service. In general, most channels meet specifications for all services. There may, however, be instances where certain channels may be selected to improve characteristics for certain special services. Again, in general, this is not necessary.

ELECTRONICS LITERATURE

Design and Operation of Regulated Power Supplies; Irving M. Gottlieb; 112 pages; price $2.95.

The text is a detailed discussion of regulated power supplies; their design, theory of operation, and applications. It is a specific one-source reference on the subject in which all technicians, students, hobbyists, engineers, amateurs and experimenters are certain to find invaluable material.

Comprehensive chapters of the text include: Basic Concepts of Regulated Power Supplies; Open-Loop Circuits Using VR Tubes; Open-Loop Circuits Using Zener Diodes; The Closed-Loop Regulating Circuit; Typical Closed-Loop Regulated Supplies; Special Techniques in Closed-Loop Regulators.

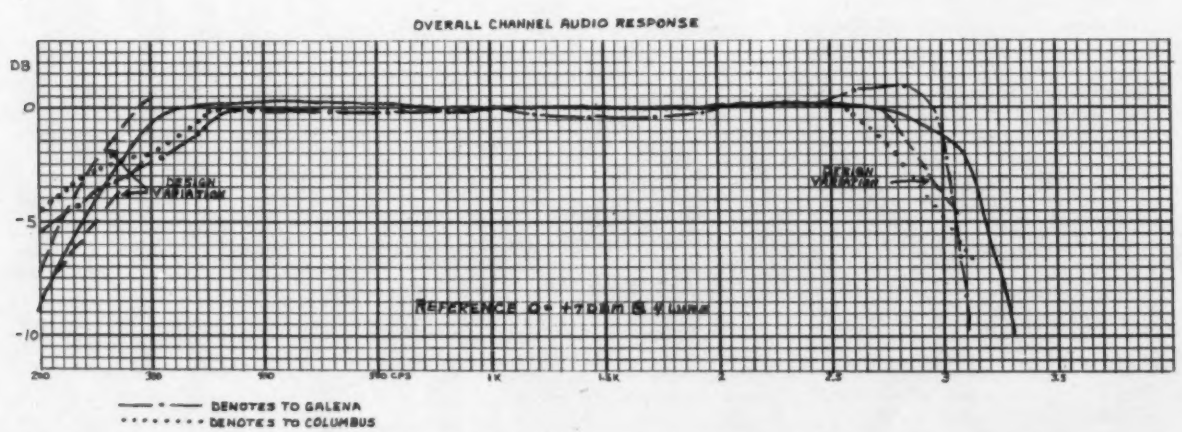


Fig. 1. Design and actual in-service channel frequency response measurements of a recently installed cable carrier system from Galena to Columbus, O. An "LN" terminal is located at Galena, Ohio, while a Western Electric Company "N" terminal is located at Columbus, Ohio. Design parameters are for "LN" terminals tied back-to-back.

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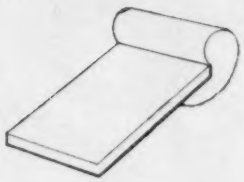

By RAY BLAIN, Technical Editorial Director

MICROFILMING, a new procedure in engineering practices that will eliminate thousands of space-consuming blueprints and increase the general efficiency, is being introduced by the Pacific Telephone & Telegraph Co. in the Los Angeles area. Similar practices by other Bell System operating companies will save millions of dollars per year.

When completed, 250,000 to 300,000 Western Electric Co.,-originated drawings used in equipment engineering will be transferred to 35 mm. microfilm mounted in cutouts or "aperture" cards. As soon as the new copies are ready, they are sent by Western Electric to engineering offices throughout the Bell System to replace the old paper copies.

Locally, the "master" microfilm cards are filed by the office service group in a modern "Simplafind" rotary file that has a capacity of 130,000 cards. When an engineer needs a drawing, a duplicate is made on a "card-to-card" printer in a matter of seconds. The duplicate is sent to the engineer, and the master goes back in the rotary file. In this way, the master file is always complete.

At the engineer's desk, the 35 mm. microfilm copy is placed in a "reader" (or viewer) with a 10½ inch x 12½ inch screen, for easy reading. Initially, 100 viewers will be used in the Los Angeles area—one for each two engineers. Should the engineer require a paper copy, for any reason, one can be made from the master microfilm copy in a matter of seconds.

Western Electric is initially converting drawings used in the step-by-step systems to microfilm aperture cards. Next will be crossbar systems, automatic message accounting systems, and PBX systems. It is estimated that 20 to 30 million microfilm cards will have to be produced and distributed to set up the 120 Bell System equipment engineering locations.

After the new system is placed in operation in the Bell System, three to five million microfilm cards will be produced and distributed annually to keep the files up-to-date.

When completed, the new system will eliminate, in the Los Angeles area alone, approximately 75 five-drawer file cabinets, and release valuable floor space now used to store engineering drawings. The new equipment required for the microfilm system will take up about as much space as a small private office.

•

Two Sacramento, Cal., restaurants are using the telephone, on a dine-and-dial basis, to bring about a friendlier atmosphere among their patrons.

The Parisi's Restaurant has opened what they called the "Tele-E-Fun" Room. This room depicts phases of communications from early days to modern times. Suspended from the ceiling is a switchboard, and a telephone is located on each table. By utilizing this semi-public system, patrons can place outside calls, receive incoming calls, or talk to diners at other tables in the restaurant.

The new Zim's Restaurant also employs a similar technique. Its "Tele-E-Lounge" consists of a large, round room with a switchboard inside a "U"-shaped bar. As patrons enter and are seated, the telephone on their table immediately rings. The switchboard operator welcomes them to Zim's. The patrons can then use the telephones to place or receive outside calls, or talk to other patrons in the lounge.

The writer observed a similar arrangement several years ago in West Berlin, Germany. An unattended dial system was used, in this case, and any patron could dial and talk to any other table in the restaurant. Or, if he preferred to send a note, a pneumatic tube system was available for that purpose. It appeared that this system was used primarily to request a dance with the partner of your choice, and the telephone was used in lieu of a formal introduction.

•

Held orders, while a thing of the past in this country, are still a major problem in the Philippines, according to two government officials from that island republic, who toured this country recently, observing our telephone facilities.

These men reported that the fast growing telephone industry in their country cannot keep up with the heavy demand for service. Many people are forced to wait a year or longer to obtain a telephone.

The Philippines has two telephone companies, one privately-owned and the other government-owned. Most of the subscribers are served by the private company which, like telephone companies in the United States, is government-regulated. The government-owned service is confined primarily to government offices.

Admittedly, having government in competition with private business creates some problems. Rates for the government service are lower, but most people are of the opinion that the private company's service is better.

•

It is reported that false fire alarms in Washington, D. C., cost taxpayers an estimated $250,000 last year. In one recent month, there were 185 false alarms turned in, which is a record. The fire marshal's office estimates that 40 per cent of these were deliberately false.

Cities such as Miami, Fla., which have changed to telephone-type fire and emergency reporting have found that false alarms are drastically reduced. It is quite obvious that people are reluctant deliberately to make a false report over a telephone, but that many do not hesitate to pull the lever on an alarm box and run.

•

Recently, the writer inquired of his good friend, Dermot K. Foley, a telephone man in San Diego, Cal., how it happened that so many good ideas originate on the west coast. His reply was essentially as follows:

"That is a good question, and it requires a good answer. It could be that we are a young part of the country, not too hidebound by any traditions, far too busy keeping up with our vast daily population influx.

"We are forced by necessity to con-

Washington National Airport, Washington, D.C., 1939.

...and hasn't been heard from since

That's only 23 years. Some of our installations go back as much as *60 years* and "haven't been heard from since." With more miles in use than any other conduit, Orangeburg Brand Fibre Conduit has proved itself job by job, time after time. No wonder it's the sought-after-brand for every application.

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stantly seek faster, better and less expensive ways to get our plant in the air and underground, and on the customer's premises. Because our physical surroundings are so new—new shopping centers, new subdivisions, new freeways, new and beautiful buildings —we consciously, or unconsciously, think "new". New ways to do things. New services to sell.

"In the process, we threw the book away, the spec book, that is, and came up with some earth-shaking new techniques. We found that just because 'it has never been done that way before' was not a good enough reason for not trying it. Some ideas tried were found to be wanting, but the vast majority were howling successes.

"There is a room at San Diego, North District Construction Office on Ulric Street, where displayed on the walls and floor are a vast array of new—radically new—equipment, material, and techniques that would shake the hide-bound traditionalist telephone man down to his boots. These innovations are in daily use in this area.

"There could be another reason we are credited with so many good, new ideas on the west coast" he said, "and that is that we are not hesitant about rushing into print when we come up with something too good to keep."

•

The Southern New England Telephone Co. has a "Wise Owl Club," whose members are men whose eyesight has been saved as a result of wearing safety lenses at the time of an on-the-job accident. This club is sponsored by the National Society for the Prevention of Blindness, and its primary purpose is to eliminate needless industrial eye injuries by wearing safety glasses. Two plant men were awarded membership certificates and Wise Owl lapel pins recently with appropriate ceremony.

One accident happened when a man was loading a coil of wire on a truck. One end of the wire, which became entangled in another coil, sprang up, striking his safety goggles with considerable force.

The other accident happened while an installer was drilling into a wall. The end of the drill snapped off and flew up into the face of the workman, striking the safety goggles.

"Cross Talk"

It is claimed that the status symbols of present-day, rising young executives are the two-button suit and the five-button telephone.

•

People will not get really excited over fall-out until it begins to interfere with television reception.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. What is considered a safe overlap of the two sections of an extension ladder?

A. Safety engineers generally agree that a special handline carrier should be used for this purpose. This is a device that may be attached to the body belt by a rawhide strap about 8 inches in length. A steel loop is designed to secure the end of the rope, but to release it when under a predetermined strain.

•

Q. Describe the Citizens Band radio and indicate what is required to obtain a license to operate a set.

A. The Citizens Band Class D Radio Service was authorized by the Federal Communications Commission in September, 1958. The 27-megacycle band is VHF, and is limited to line-of sight range. This range usually provides good communication within an area up to 20 miles. Hills and built-up areas will probably reduce this range.

Technical knowledge is not required, and no tests need be passed in order to obtain a license. A license is issued by the FCC to any U. S. citizen over 18 years of age who fills out an FCC Form 505, and indicates a legitimate reason for desiring Citizens Band Radio.

This form may be obtained from, and returned to the FCC, Washington 25, D. C. A delay of six to eight weeks may be expected, at the present time, before a license is received.

•

Q. Please advise where we may obtain a book that will provide general information on rockets, missiles and space vehicles.

A. A cloth-bound book of 272 pages, titled: "Fundamentals of Rockets, Missiles, and Spacecraft" may be purchased from TELEPHONY for $8.95.

This pictorialized presentation contains the entire story of rocketry from its early days, and gives the reader an insight into the complete anatomy of rockets and missiles with detail on rocket fuels, engines, air frames, nose cones, and other important components that make up these devices. A wide variety of missiles is explained in much detail, with considerable attention given to launching methods and operation. The book will be enjoyed by anyone interested in the historical development and principles of rockets, missiles and spacecraft.

•

Q. What is the Jet Line Gun, and how is it used to place a line through a length of conduit?

A. The Jet Line Gun is a device designed to shoot a nylon cord through rigid conduit, to facilitate the placing of a pulling-in line. This device may be used on conduit from 1-1/4 inches to 6 inches in diameter, and up to 600 feet in length. This tool, when properly used, proves to be a real time and labor-saver.

•

Q. How does self-supporting aerial cable differ from the conventional type?

A. Self-supporting cables are designed for aerial installation without a supporting messenger. They are intended primarily for exchange line use. Cooper-steel or hand-drawn copper conductors are used, which serve the dual function of strength-supporting members and conductors.

This type of cable is recommended for use where field conditions make the use of a supporting messenger impracticable. It is also often used to good advantage for aerial cable entrances to apartments or office buildings.

Installation is simplifed by the use of easily installed preformed hardware, which eliminates the labor and material costs associated with the installation of messenger strand and field lashing procedures. When #19 gauge 40 per cent conductivity copper-steel conductors are used, adequate strength is provided for the construction of long spans in all loading areas. Self-supporting cable is available in 6, 11, 16 and 26 pairs.

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COMMERCIAL CORD

Courts and Commissions

Asks Ark. PSC to Stop City's Bid to Purchase Exchange

The Hardy Telephone Co. on Mar. 14 asked the Arkansas Public Service Commission either to defer action or to dismiss the petition of the city of Salem to buy the telephone facilities at Salem which are owned by the Hardy company (TELEPHONY, March 10).

The city had voted last December to buy the telephone system from the Home Telephone Co., which is the former name of the Hardy company. Salem city officials subsequently asked the commission to fix a price for the exchange.

The Hardy company, owned by Ralph Grable of Hardy, contends that the Home company didn't own any telephone properties and therefore the Salem petition was directed toward the wrong company. Furthermore, the Hardy Telephone Co. claims that the city never has made an offer to buy the system.

A suit has been filed by the Hardy company in Fulton County Chancery Court to stop Salem from buying the exchange. The company has asked the commission not to act, pending the outcome of the suit.

Mr. Grable contends that although the Salem exchange was known as the Home Telephone Co. for many years, the name was changed in early 1961 to Hardy Telephone Co.

Wis. PSC Approves Rate Increases for Two Companies

The Wisconsin Public Service Commission on Mar. 8 approved two rate increase requests as follows:

Cumberland Telephone Co. was allowed to raise rates by $6,731 annually (TELEPHONY, July 22, 1961).

Cream Valley Telephone Co., Hawkins, was given approval for a $17,000 increase (TELEPHONY, Nov. 4, 1961).

Ariz. Man Dies; Claim Two Refused to Give Up Line

Two women were charged in a complaint filed in Phoenix, Ariz. City Court with failure to relinquish a party telephone line in a case where help was requested for the victim of a fatal heart attack, according to a Mar. 14 report.

The complaint was filed by Mrs. Bernice Murphy against Mrs. Harry Esler and Mrs. Sally Jarvis.

Mrs. Murphy charged that she tried to cut into a conversation between the two women on Mar. 2 to summon help for her husband who had suffered a heart attack. Mrs. Murphy's husband died.

Detectives reported that Mrs. Jarvis said she heard Mrs. Murphy cut into the conversation but thought it was children playing.

NW Bell Gets OK of New Items, Neb. Area Maps

The Nebraska Railway Commission issued the following orders on Mar. 14:

The Northwestern Bell company was authorized to add two new items to its provisions for "Alternate Use of Private Line Telephone Service Channels". These items, known as "Channels for Data Transmission", will consist of a transfer key, at an installation charge of $5.00 and no monthly charge; and special alternate use charge of $15.00 per month with no installation charge. Deletion of reference to "telewriting" from the portion of the tariff covering the "Alternate Use of Private Line Telephone Service for Channels for Remote Metering, Supervisory Control and Miscellaneous Signalling Purposes" is also permitted. This is now provided for under "Channels for Data Transmission". Rates and charges for "DATA-Phone 600" are also now included under this section.

•

In another order, Northwestern Bell received authority to revise the service area maps of its Bristow, Broken Bow and Elba exchanges. Concurrence with these provisions was given the commission by companies serving adjoining areas. Companies agreeing are the Boyd County Telephone Corp., concerning the boundary of its Lynch exchange; the Public Telephone Co., Blair, concerning the boundary of its Callaway exchange; and the Cornhusker State Telephone Co. concerning the boundary of its Wolbach exchange. Applications had been received by the latter companies for service in the "no-man's" area between exchanges. The three companies were ordered to file revised service area maps of the affected exchanges with the commission.

Telephones, Inc. Sued Over Price Paid for Stock

Telephones Inc. of Chicago, has been named a defendant in suits filed by stockholders and former stockholders of Farmers Mutual Telephone Co. of Lynden, Wash.

According to the suits, filed in Whatcom County (Wash.) Superior Court, the stockholders and former stockholders object to the price that Telephones Inc. has been paying for shares of Farmers Mutual Telephone Co.

The plaintiffs say that Telephones, Inc., has been buying the stock at $1,576 a share from individual shareholders of Farmers Mutual. There are 1,146 shares outstanding. However, it is said a few Farmers Mutual shares were bought by Telephones Inc. for $2,500 each.

The two separate suits allege Farmers Mutual stock is worth the higher price. The suits are based, in part, on an agreement between officials of Farmers Mutual and Telephones Inc. which mentioned the $1,576 price. The plaintiffs hold that this amounted to an agreement to buy all stock at the same price.

However, a Telephones, Inc., spokesman has said the $1,576 a share figure was a minimum price. He said the agreement did not prevent Telephones, Inc., from offering a higher price in some cases, nor did it guarantee paying the higher price to all shareholders.

OK Certificate for First Regulated N. Y. Mobile Co.

The New York Public Service Commission on Mar. 21 granted a certificate of public convenience and necessity to Capital Mobile Radio Service, Inc., Albany, under which the company will render a combined radio-telephone service to its subscribers.

By a four-to-two vote, the commission ruled that since Capital Mobile proposes to render a service normally performed by a telephone corporation, it becomes subject to regulation.

Under a federal license, the company now provides two-way radio communication between its base station in Albany and cars operated by its subscribers. Under the new commission's certificate, it will be permitted to interconnect its radio facilities with telephone lines so that calls to and from

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subscribers' cars may be made in part by radio, and in part by telephone.

Without that authority, the company could only receive messages to be relayed by radio to subscribers' cars; or messages radioed to its base station could only be relayed by telephone to their proper destinations.

Arrangements have been completed between Capital Mobile and the New York Telephone Co. for the necessary land-line extensions through which radio calls to and from subscriber cars can be transmitted.

Commissioner Edward P. Larkin stated that the company's subscribers "would be materially benefited by the new proposal" and that by allowing the company to initiate the service, "a greater number of people would be given a more useful service with a wider range" through facilities which are maintained to the high standards set by the commission.

Commissioner Larkin concluded also that the proposed new service is such as to place the company in the position of a telephone corporation subject to commission jurisdiction.

Although New York Telephone Company offers a combined radio-telephone service to its subscribers, Capital Mobile is the first independent radio communications company in the state to be classified also as a regulated telephone company, according to the New York commission.

Grant N. Y. Company Okay to Issue, Sell Stock, Bonds

The New York Public Service Commission has authorized The Walden Telephone Co. to issue and sell 3,700 shares of 5½ per cent cumulative preferred stock at not less than $50 par value and $300,000 principal amount of 5¾ per cent first mortgage bonds due in 1987.

The estimated $485,000 proceeds from the sale of the new securities would be used to discharge current debts. The company expects to sell the new shares directly to investors and the mortgage bonds to an insurance company.

In seeking authority to issue the new securities, the company said its 1962 construction program will involve expenditures of about $125,000.

Stockholders of Wis. Company Approve $2,750,000 Financing

Stockholders of Wood County Telephone Co., Wisconsin Rapids, Wis., have approved a long-term financing plan, which includes borrowing $2,750,000 to satisfy indebtedness and cover costs of expansion.

H. B. Flower, executive vice president of the company, stated that the transaction is a 20-year mortgage arranged with the Wisconsin State Investment Board.

Of the loan, $1,177,000 will be used to retire a current mortgage held by the State Annuity Board; $200,000 will be used for retirement of short-term notes; and the remaining $1,373,000 will be used to expand Wood County's facilities.

Hearing Set on Request for Raises at 4 Ark. Exchanges

The Arkansas Public Service Commission on Mar. 28 was to have held a final hearing on the rate increase request of the Walnut Hill Telephone Co., Lewisville (TELEPHONY, Feb. 4, 1961).

A temporary increase was put into effect at Lewisville in November 1960 after the inauguration of dial service. However, at the same time the commission suspended the company's request for higher rates at its Bradley, Mineral Springs and Foreman exchanges.

File Requests to Sell, Borrow $114,000 in Mo.

On Mar. 19, the Missouri Public Service Commission received the application of Carl J. Thompson and C. R. Pickrill, doing business as the Southwest City Telephone Co., to sell, and of the Southwest City Telephone Co., Inc. to purchase the exchange at Southwest City.

In another application filed by the Southwest City Telephone Co., Inc. on the same date, the applicant asked to borrow a sum not in excess of $114,000, and to issue its promissory note and trust indenture as security.

Neb. Supreme Court Reverses Commission Service Order

The Nebraska Supreme Court on Jan. 5 reversed an order of the Nebraska Railway Commission of Mar. 8, 1961, in which the commission gave permission to switching subscribers at Eddyville, Cozad and Oconto to transfer to Lexington, or to obtain service from "any operating company of their choice operating within the area" (TELEPHONY, Jan. 20). The latest order of the commission revoked an earlier order of Nov. 23, 1960, in which it had denied the subscribers' application.

Companies involved in the case were the Eddyville Telephone Exchange, Cozad Telephone Co., the Oconto exchange of the Public Telephone Co., Blair, and Northwestern Bell Telephone Co., which operates the Lexington exchange.

The switching subscribers had pro-

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IT'S A MATTER OF RECORD

tested that their lines became inoperative through lack of maintenance. The Public Telephone Co., however, contended that lack of service was due to users' neglect, and offered to assist with rehabilitation.

Northwestern Bell maintained that the protesting users were not within its territory.

Northwestern Bell and the Public company then protested the commission's ruling of 1960, and carried their appeal to the Nebraska high court (TELEPHONY, July 29, 1961). Their brief stated that the commission erred in finding it in the public interest to permit users to obtain service where they chose.

The Nebraska commission on Mar. 14, 1962, stated that its order of Nov. 23, 1960 "should be re-instated and given force and effect, in conformity with a mandate issued on Feb. 20, 1962 by the Supreme Court of Nebraska, and docketed under the court's General No. 35048."

The commission added that its order of Mar. 8, 1961, "in the matter of the application of Ferd W. Kopf, et al., Eddyville, Neb., for authority to be released from the Eddyville, Cozad and Oconto exchange areas, is, hereby vacated. . . . "

Sues NW Bell, Claims Neglect In Directory Omission

Douglas R. Olsen of Minneapolis has sued the Northwestern Bell Telephone Co. in Hennepin County (Minn.) District Court for $5,000 for alleged failure to list his name in the company's 1961 classified directory.

Mr. Olsen stated that he has advertised in the Yellow Pages for many years and that he paid the $15 required to insert his name as an agent for State Farm Mutual Automobile Insurance Co. in last year's directory.

In his suit against the company, he contended that the company "negligently and carelessly" failed to list his name in the directory; and as a result, he said, he has lost customers and has had to undertake an expensive advertising campaign.

Approve Raise in Kansas

Craw-Kan Telephone Cooperative Association, Girard, on Mar. 15 was given permission by the Kansas Corporation Commission to raise rates at 14 exchanges (TELEPHONY, Feb. 17). Increases will be effective in Girard, Arma, Cherokee, Weir, Hepler, Hiattville, Brazilton, Farlington, Devon, Fulton, Walnut, Mulberry, Arcadia and Uniontown.

'61 Safety Council Awards to Four Independent Companies

Awards for the lowest accident frequency rate among telephone companies during 1961 have recently been announced by the National Safety Council in connection with the communications division of the public utilities safety contest.

Three awards were made in Group A, which comprises companies with a total of more than 10,000 man-hours worked monthly. First place winner in this group was General Telephone Co. of Florida, Tampa, which received a plaque. The company reported a 2.21 accident frequency rate per million man-hours.

General Telephone Co. of Michigan, Muskegon, ranked second, and received a certificate. Its accident frequency rate was 2.30.

General Telephone Co. of the Southwest, San Angelo, Tex., was in third place, with an accident frequency rate of 2.99.

The fourth winner, also an Independent telephone company, was in Group B of the contest, composed of entries from companies working an average of between 1,000 and 10,000 man-hours monthly. Here, the Logan

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County Rural Telephone Cooperative Corp. Inc., of Auburn, Ky. took the honors, with a perfect record of no disabling injuries.

A National Safety Council spokesman explained that the awards in this contest are based on the number of disabling injuries per one million man-hours worked.

Leavey, Jaquette Elected to Board of Hawaiian Company

Hawaiian Telephone Co. shareowners on Mar. 22 elected to the board of directors Gen. (ret.) Edmond H. Leavey, former president and chairman of the board of International Telephone & Telegraph Co., and John J. Jaquette, executive vice president and secretary of Hawaiian Telephone.

Their election and the re-election of other board members increase the firm's board to 17 members.

Approve EAS in Illinois

The Illinois Commerce Commission on Mar. 23 authorized the General Telephone Co. of Illinois, Bloomington, to establish two-way EAS between its Marshall exchange and the Clarksville exchange of Clarksville Farmers Mutual Telephone Co.

BELL TELSTAR EXPERIMENT THIS YEAR

Concluded from page 28

operation of a satellite testing and tracking facility to be used preceding and during launch at Cape Canaveral.

(5) The launching of experimental satellites by the National Aeronautics & Space Administration using Douglas-built Delta rockets and the Bell Laboratories command guidance system. The Bell System will pay the costs of launching by NASA, approximately 3 million dollars for each launch, whether or not the launching is successful. (Each prospective launch is backed up by a possible shot about two months later. The first satellite is scheduled for launching in late spring with a later backup if needed. A second experimental satellite may be launched in the fall possibly followed by its backup.)

(6) Communications and tracking experiments at Andover, Me., and Holmdel, N. J.; later this year participation in transatlantic experiments with overseas organizations; reception of data on performance of the satellite at Canaveral, Andover, and NASA tracking stations; and subsequent analysis of the data at Bell Laboratories.

Another experimental communications satellite, NASA's "Relay," is expected to be launched in mid-1962. Bell Laboratories engineers at Andover will participate with NASA in transmission experiments using this satellite, and for that purpose are installing a special transmitter supplied by NASA at the ground station. Receiving equipment will be the same as for Project Telstar.

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"Happiness is a sunbeam which may pass through a thousand bosoms without losing a particle of its original ray; nay, when it strikes on a kindred heart, like the converged light on a mirror, it reflects itself with redoubled brightness. It is not perfected till it is shared."—JANE PORTER.

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BEAT COMPETITION, MINN. URGED

Concluded from page 26

to 'work hard'—that's perspiration; 'think big'—that's information; and 'have a dream'—that's inspiration."

Good Growth in Minnesota

A report on the growth of the telephone industry in Minnesota during the past year, presented by Keith W. Vogt, executive secretary-treasurer of the Minnesota association, revealed that as of Dec. 1, 1961, there were 1,447,679 telephones in service—an increase of 57,742 since the same date in 1960.

Of the total telephones in service, Bell services 1,173,479 and the Independent companies, 274,200.

Mr. Vogt said that during 1962, 30 additional Minnesota communities were converted to dial service, including seven exchanges operated by Bell and 23 operated by Independent companies. Bell's Minnesota telephones are now 97.2 per cent dial, and the Independents' telephones, 90 per cent dial.

"Of the 524 Minnesota communities served by Independents, there are only 27 exchanges, serving 24,028 telephones, providing common battery telephone service; and only 51 very small exchanges, serving only 7,202 telephones, which still have the old magneto crank-type service," Mr. Vogt reported.

Pioneers Meet

One of the features of the Minnesota convention was a breakfast meeting of the North Star Chapter of the Independent Telephone Pioneer Association. Daniel W. Carr, director of the telephone division of the Minnesota Railroad and Warehouse Commission, was the speaker.

A panel discussion on rural telephone expansion progress was held on the first day of the convention. The discussion centered around the Rural Electrification Administration's telephone loan program.

The program, from REA's viewpoint, was aired by Arthur H. Schartner, REA's north central director; Joseph E. Kaplan, north central operations attorney; and William J. Nichols, north central engineering chief. All are from the Washington REA office.

Two rural Minnesota telephone company managers—David Kocka of Consolidated Telephone Co., Brainerd, and Willard Anderson of Federated Telephone Co-Op, Chokio—also participated.

Other panelists were Daniel W. Carr, telephone division director for the Minnesota Railroad and Warehouse Commission; Bruce Morton of Minneapolis, Northwestern Bell Telephone Co. Independent company relations coordinator; L. E. Armfield, president of Communications Consultants, Fargo, N. D. engineering firm; and T. P. Hultkrans, manager of Harfill, Inc., St. Paul, which provides billing services for small telephone companies.

Officers and Directors Named

The convention elected the following directors: Glenn Dwelle of Lake City, Steve Halvorson of International Falls, Harold Peterson of Erskine, John Hinrichsen of Waconia and A. E. Lindekugel of Fairmont.

Other officers are H. James Boyd of Alexandria; Robert W. Bunke of Houston; Charles R. Cashel of Worthington; Kenneth P. Ellefson of Ada; P. M. Ferguson Jr. of Mankato; John G. Holland of New Ulm; Herbert J. Lien of Blackduck; Vies Martinsen of Grand Meadow; James E. Olson of Minneapolis and Kenneth M. Peterson of Kerkhoven.

The directors elected the following officers: President, Mr. Ferguson; vice president, Mr. Holland, and executive secretary-treasurer, Keith W. Vogt.

Mid-Continent Reports '61 Earnings of $1,252,294

Mid-Continent Telephone Corp., Elyria, O., on March 21 reported net earnings for 1961 of $1,252,294, equivalent to 78 cents per share; compared to $1,140,986, or 70 cents per share for the previous year.

The figures for both years reflect the total earnings of eight companies currently affiliated to Mid-Continent.

In announcing results for the year ending Dec. 31, President Weldon W. Case also noted that in less than two years since the formation of Mid-Continent, annual earnings of the system have increased nearly 10 per cent, based on consolidated figures for the eight affiliates.

Operating revenues for the system in 1961 were $8,097,119, compared to $7,524,745 in 1960.

At the same time, the board of directors of Mid-Continent announced a dividend increase to 13 cents a quarter from the previous 12 cents, raising

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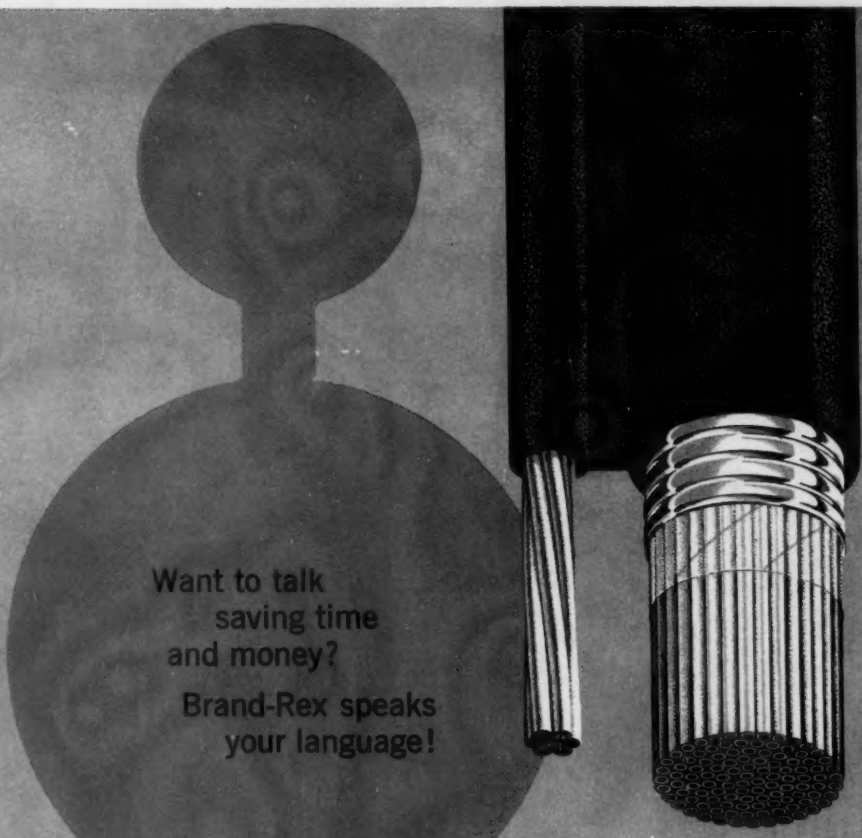

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the annual dividend rate to 52 cents from 48 cents.

Formed in June, 1960, with five affiliated telephone companies in northeastern and southeastern Ohio, the system added three more affiliates in 1961, including the Ashtabula Telephone Co., which operates in Ohio's second largest port.

The Mid-Continent system currently serves more that 84,000 telephones, a 68 per cent jump over 1960.

ABOUT SPACE COMMUNICATIONS

Continued from page 23

lite company. The report recommended that any U. S. communication company, authorized by the FCC to do business via the satellite system, would be allowed to purchase a part ownership in the satellite system. If such companies do not elect to purchase an interest, they could at any time, if authorized by the FCC, lease facilities. General Telephone & Electronics Corp. after some preliminary correspondence with the FCC indicated they would be willing to commit "at least $500,000."

Structure of Corporation

With respect to the structure of the United States Satellite Corp. the members of the *Ad Hoc* Committee went on to say:

"The satellite corporation would be so structured that it should not be controlled by any one United States carrier. Each participant in ownership of the satellites, irrespective of its capital commitment, would have equal representation on the board of directors of the satellite corporation in the form of two directors appointed by such participant, provided that its capital commitment shall be $500,000 or more. No more than two directors would be permitted from any affiliated group of companies. To further reflect the public interest and to broaden the base of board representation, three public directors, one more than the representation by any single carrier, would be appointed by the President of the United States or by whomsoever he shall designate to make the appointments. In addition, those United States carriers not electing to make capital commitments of $500,000 or more but which may lease facilities in the satellites would collectively designate one director to represent their interests."

The *Ad Hoc* Report stated, "each United States carrier would be permitted to establish its own ground stations, participate in joint ownership of ground stations with other United States carriers, or rent capacity in ground stations of other carriers—all as authorized by the FCC. The commission has authority, under its licensing and rule making powers, to determine the nature and number of United States ground stations that would serve the public interest, convenience or necessity. The commission can assure, in this connection, that each authorized United States carrier would have equitable access to, and non-discriminatory use of, the satellite system under fair and reasonable terms. Carriers which provide ground stations would be required, on reasonable terms, to lease capacity to other carriers.

"This plan would allow the smaller carriers to own part or all of the ground stations serving their geographic areas or to lease facilities in such ground stations as authorized by the commission and would not require them to invest in all of the United States ground stations.

"We have considered a proposal that all the ground stations located in areas under United States jurisdiction and the United States interests in the satellites be owned and operated by a single entity. We believe that our recommendation provides a more workable arrangement with greater flexibility and opportunity for beneficial competition in the public interest."

Western Union's Statement

The report of the *Ad Hoc* Carrier Committee was not unanimous. Western Union Telegraph Co., as an example, set forth their views in a separate statement. Western Union believes, said the report, "that a publicly held satellite corporation, including aerospace and domestic communication industries, should be organized to own and operate the satellites and all United States ground stations as a common carrier's common carrier and lease circuits in the system to communications common carriers."

The FCC has not commented on the *Ad Hoc* Carrier Report since it was filed Oct. 13, 1961. The significance of the report lies largely in the fact that it was a studied consideration of the international common carriers unanimously and strongly advocating ownership and operation of a space satellite corporation by the common carriers.

More and more it is being referred to as a factual report or a practical busi-

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nessman's study of the subject of space satellite communications. Not to be over-looked is the factor that the majority of the carriers recommended that the ground stations should be separately owned from the satellite corporation and that the latter should be owned by carriers authorized by the FCC to do business via the satellites.

The importance of these points with respect to the *Ad Hoc* Carrier Committee Report looms greater and greater as various bills are being proposed for Congressional action.

Next week's article will discuss some of these proposals.

A TVA IN THE SKY

Continued from page 19

votes in either the Senate or the House. But don't sell them short! There is a clear and present danger that, with all this argument between supporters of the Kennedy administration's public stock ownership bills and the private carrier ownership bills, Congress will fall between two stools, and do nothing at the present session. Then, watch out! Such a situation is made to order for the public ownership boys.

Needless to say, the public ownership crowd realizes that their best, if not their only chance of success is to spread confusion and delay. It is not merely a coincidence that the leading advocates of direct public ownership are the two senators from Tennessee —home of the TVA. They are playing a well-practiced game. On Mar. 21, Senator Gore asked that the Senate Anti-trust Sub-committee conduct hearings and an investigation into the space satellite proposals. The following day, Senator Kefauver, chairman of the sub-committee, announced that such hearings would be held. A typical Alphonso-Gaston act. This is the old technique of throwing feathers, manufacturing diversions and distractions to head off prompt action by Congress.

The hearings on the Kerr Bill and the administration's bill have plainly shown that the double class stock corporation idea of the Kennedy administration, however well meant, is full of bugs and unnecessary regulatory duplication. It commands little backing in Congress. Even the government agencies and telephone labor interests find fault with it. The FCC and CWA have both panned it. In addition to this, the AT&T, the IT&T, and the Independent Hawaii Telephone Co. have registered opposition. Even the Department of Defense and the National Aeronautics and Space Administration were unable to support it. If a vote were taken right away, the verdict

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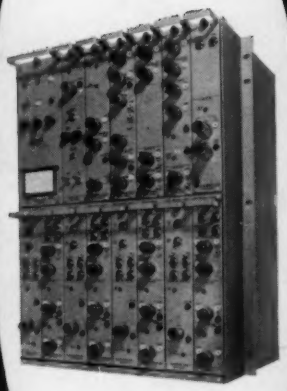

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would lie somewhere between the Kerr-Miller Bill (5.2650 and H.B.9696) for a satellite corporation owned by the participating carriers, and several House bills calling for joint ownership by the participating carriers. (H.R.-10586, 10747, and 10104).

What is needed right now is for Congress to get on with the job. There are too many balls bouncing around Washington on this subject. Unless a showdown can be brought about in the near future, a TVA-in-space is a real possibility.

As we pointed out in an editorial in the July 29, 1961 issue of TELEPHONY, we believe there are "too many cooks" in the satellite communications picture in Washington. At that time we said:

"And we don't want Uncle Sam in the telephone business or any other communication business. We don't ever want his foot in the door. Uncle Sam has plenty of other things to do where he is really needed. The United States today has the best and most telephone service in the world because it was developed first and last as a private enterprise system. We could change all that before we know it, if we allow too many cooks to mess or meddle in the stew in Washington."

We believe it's time for Independent telephone people to start writing their congressmen. They should tell them to get on the ball. They should demand a continuation of private ownership of American international communications services which have been so successful up to now. To delay further is to flirt with a spreading wild fire of misinformed public enthusiasm for government ownership, sparked by such events as Colonel Glenn in orbit. This is strictly telephone business. It has nothing to do with U. S. space prestige or the feats of the astronauts.

President Kennedy said he was for private ownership of the satellite communications system. Let us take him at his word. Let us repudiate the bold schemes of the TVA-in-space agitators in Congress.

IN THE NATION'S CAPITAL

Concluded from page 21

its modern new facilities were completed in southwest Washington, is being renovated as an office building and will be completed next summer. The GSA plans to consolidate FCC's four locations into two by leasing part of the old *Star* building, a stone's throw from FCC's headquarters in the Post Office Building. Hearing rooms and offices of the commissioners will remain in the present location in the Post Office Building.

Boutin described the move as "semi-permanent" but said it does not preclude a new headquarters building eventually. There used to be an old quip in the Capital about the "tempos" which were built during World Wars I and II that, "There is nothing so permanent in Washington as a temporary building." We shudder to think how many eons are encompassed in the term "semi-permanent."

Rumors on FCC Appointment

The Washington rumor mill has been transmitting a report that FCC Commissioner John S. Cross, former State Department telecommunications expert who was appointed to fill the unexpired term of Richard Mack in 1958, will not be nominated for another term. Cross has indicated he wants to stay on the job and the congressional delegation from his home state of Arkansas will no doubt give him its blessing, but the folks at 1600 Pennsylvania Avenue reportedly have not decided about the reappointment.

Chief contender for Cross' job is Kenneth A. Cox, chief of FCC's Broadcast Bureau. The former Seattle attorney served for a number of years as special counsel on communications matters for the Senate Commerce Committee.

Cross, because of his experience in telecommunications, probably has a better understanding of telephone industry problems than Cox would.

Ga. Jaycees Award Given Posthumously to Telephone Man

The Dahlonega, Ga., Junior Chamber of Commerce on Mar. 12 gave their annual distinguished service award posthumously to Phillip E. Ragland, who, until his death, was an employe of the Standard Telephone Co., Cornelia.

The Jaycees also gave H. M. Stewart, president of the Standard company, a certificate as an "outstanding boss."

Mrs. Ragland accepted the plaque for her 28-year-old husband who died two months ago. Jack Street, Jaycee president, said that the decision of the awards committee was unanimous.

The award was made, he said, because of Mr. Ragland's "outstanding work in the community as a Jaycee. He was a man who certainly distinguished himself in our community."

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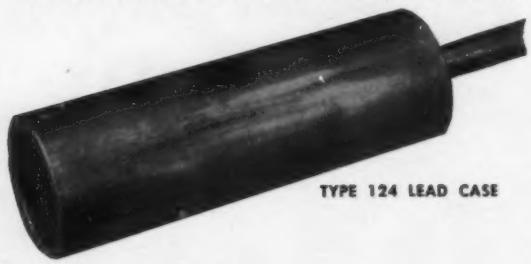

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Mr. Ragland worked "long and hard", Street said, to help complete the Lumpkin County High School football field-the Jaycees' main project in 1961.

"He climbed poles to put up the lights at the field one week, and went back to the hospital the next," Mr. Street commented. "Most of us never knew he was sick at the time."

Mr. Stewart was honored "not only for his work in the community, but for his attitude toward his employes."

USITA 1963-64 Convention In Miami and Los Angeles

The 1963 annual convention of the United States Independent Telephone Association will be the first USITA convention to be held elsewhere than Chicago in over 50 years.

The USITA board of directors at its recent spring meeting voted to hold the 1963 convention at the Fountainebleu Hotel in Miami, Fla., on Nov. 3 to 7.

The board also voted to hold the 1964 USITA convention in Los Angeles, Cal., in early November, at either the Ambassador or Biltmore Hotel.

The 1962 convention will be held at the Conrad Hilton Hotel in Chicago on Oct. 22 to 24.

Among other actions, the USITA directors:

(1) Confirmed the USITA executive committee's December resolution restricting future convention attendance to dues-paying members of the association.

(2) Elected D. S. Guild, president of the Hawaiian Telephone Co., a director to fill the vacancy created by the recent death of J. Ballard Atherton.

(3) Adopted a resolution providing "that no company or group of companies under one ownership shall pay more than 49 per cent of the association's estimated annual expenses in any one year."

(4) Approved recommendations submitted by the Committee on Review of USITA Advertising Program, and adopted a resolution directing that the association's advertising program be re-oriented to an advertising and public relations program for the realization of certain objectives within defined cost limitations. Under the terms of the resolution, the USITA Advertising Committee, renamed the Public Relations Committee, will formulate an advertising and public relations program for implementation in 1963. It was also decided to set aside each year approximately 10 per cent of the total advertising and public relations budget for the production of new Independent industry films.

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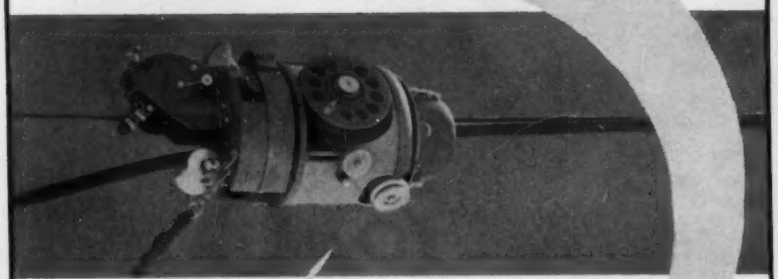

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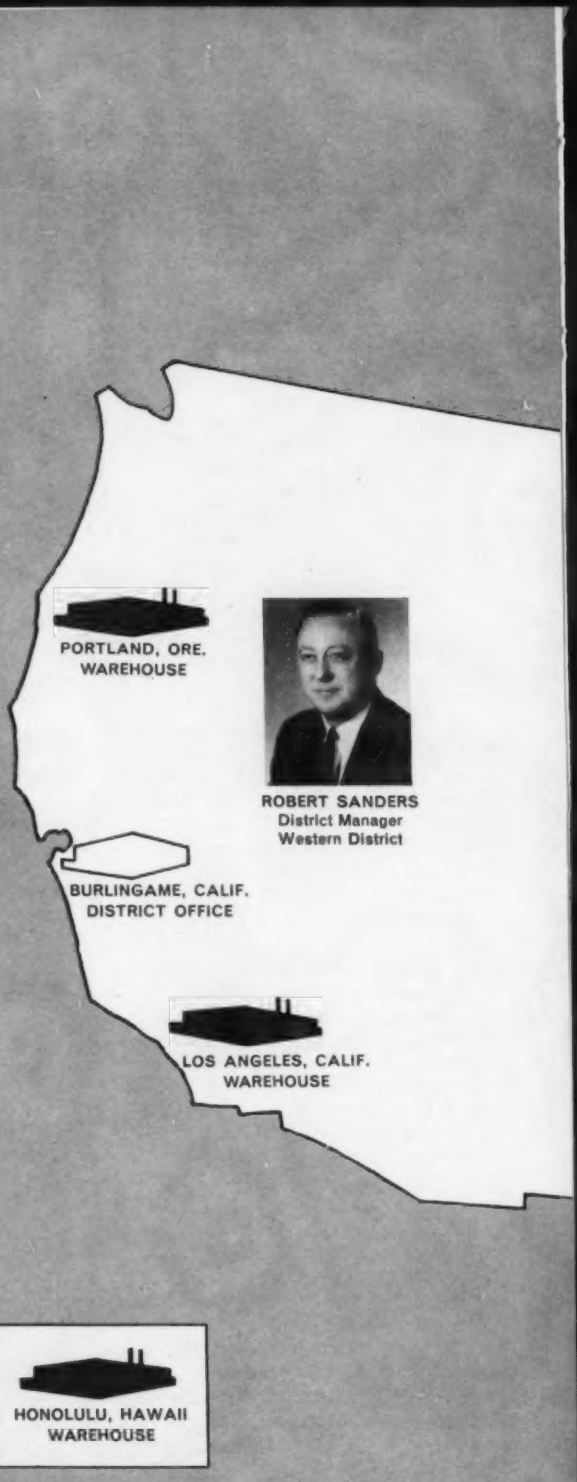

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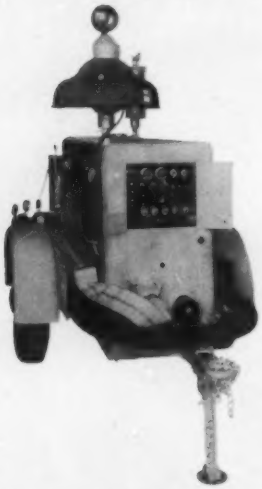

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News on New Products

ELECTRIC PLANTS—Plans for immediate marketing of two new "J" series electric plants, largest models in the company's new "J" Line, were disclosed by Onan Division of Studebaker-Packard Corp.

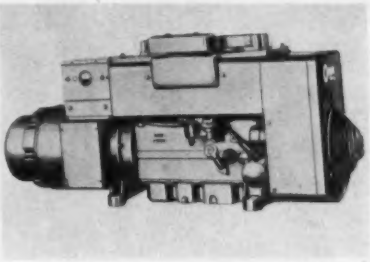
The available units, a 10,000-watt model 10JC and 15,000-watt model 15JC, are said to provide a versatile source of power, sized and designed to meet the needs of several major markets—emergency standby power, mobile applications, and portable applications.

Lightweight, compact design and rugged construction are claimed to give the new models added appeal for portable duty in the utility and construction fields. Trailer or dolly-mounted plants can be swiftly moved from one job site to another, or into a disaster area for clean-up or maintenance operations.

JC models now available operate on either gasoline or gaseous fuels (natural gas, butane, propane or LP).

The compact, four-cylinder, overhead valve engine, power source for these generating sets is built entirely by Onan, and is one of 12 different models—all produced from one basic set of tooling. All have the same basic design and dimensions. Most parts are interchangeable throughout the series, Onan reports.

Both the 10,000 and 15,000-watt models have all-climate insulated, revolving field generators equipped with the Onan "magneciter". Onan "magneciter" generators, according to the company, have static exciter, magnetic amplifier and voltage control providing greater stability with virtually no maintenance since there are no moving parts to wear out. Voltage fluctuation with sudden load change is reported to be cut to a minimum. Commutator, dc brushes and many electrical connections are eliminated.



Either model is reconnectible to deliver the type of voltage required—120-volt, 2 wire; 240-volt, 2 wire; or 120/240-volt, 3 wire. Other standard 50 and 60 cycle voltages available. Request NP1854.

•

BOLT ANCHOR—Diamond Expansion Bolt Co., Inc., announces the addition of the Di-Ex machine bolt anchor to its line of masonry and hollow wall fasteners. The Di-Ex anchor is available, the manufacturer says, in four sizes—¼ in., ⅜ in., ½ in., ⅝ in.—for fastenings to all types of masonry and concrete.

One of the most important new features of this anchor is the holding power derived from its threaded expander nut. Unlike threaded shell type

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461A	AMPLIFIER, POWER
12912	EQUALIZER
13530A	COMPROMISE NETWORK
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13594	RELAY ASSEMBLY
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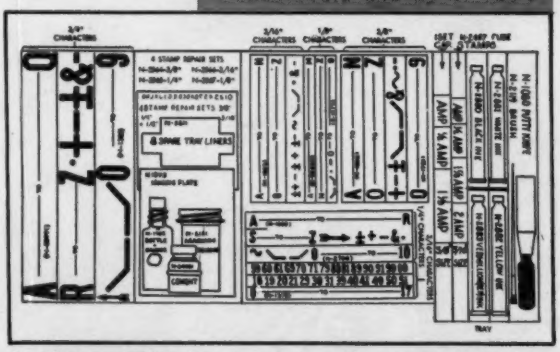

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It's a *custom* service for shipping docks, warehouses, production lines; for areas where people cannot leave their posts. It's ideal for lengthy calls, reports or conferences.

A voice operated relay (V.O.R.) permits complete "hands-free" operation of the station. Standard SP-3 does not allow call origination; complete control is maintained by the calling telephone.

No manual switching or push-buttons are required. The calling party simply dials the speaker-phone station from any phone in the system and starts talking. The called party answers from any point within a 40' radius.

The input signal from the telephone line can be as low as —10 db.

The 5 watt output of the SP-3 is ample to drive one or more high penetration speakers in high noise level areas.

The SP-3 Speaker-Phone Amplifier can be used in any independent phone system with the addition of a ring trip circuit. With Telecom automatic switchboards (and similar internal phone or intercom systems) connection to the board is made with a standard two (2) conductor telephone line.

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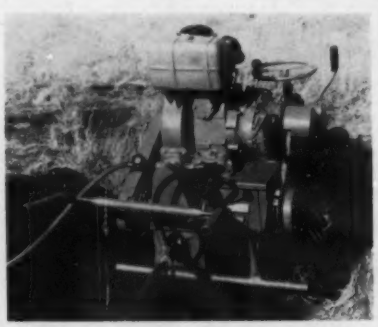
anchors, the load pull, Diamond states, is concentrated on the expander nut and not on the shell. Di-Ex is also a true one-piece anchor having no separate or loose parts and utilizing only standard drill sizes.

Di-Ex is claimed to be easily installed and easily expanded. To install, the operator drills hole to depth clearly marked on anchor, inserts anchor and expands by striking with hammer. This anchor can also be expanded by tightening the bolt which pulls the expander nut into the shell. This feature is said to eliminate the critical hole depth required by threaded shell type anchors.

The Di-Ex anchor can be used where load requirements are either axial or shear and under vibration. Its die-cast construction is reported to enable it to readily conform to hole and material irregularities providing heavy duty performance at the cost level of lighter type anchors. Request NP1855.

•

BORING ATTACHMENT—Roto Witch, a new small-line boring attachment for Ditch Witch trenchers is now available, according to the manufacturer, Charles Machine Works, Inc.



This new horizontal boring device is especially designed to bore trench beneath surface obstructions, such as paved streets, sidewalks, driveways, tracks and planted areas. It eliminates tearing up pavement and reduces damage to a minimum, Charles Machine reports.

The Roto Witch attachment is claimed not to affect efficiency or capability of the Ditch Witch in its trenching operations. Utility companies and contractors will find the Roto Witch equipped Ditch Witch excellent, Charles Machine says, for doing the complete job of trenching and boring for distribution and service line installations. The operator is able to trench up to the obstruction, then bore under it. One machine does it all.

Roto Witch bores holes up to 4-inch diameter and up to 100 feet long—(back reams up to 8 inches in diameter). Three bit options are offered: Water-circulation bit in areas of difficult penetration, auger bit and compaction bit. Roto Witch is available on M3 and M4 series Ditch Witch trenchers and may be field mounted on any of these machines. Request NP 1856.

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FIBERGLAS TELEPHONE BOOTH—A new full-sized telephone booth constructed of Fiberglas reinforced polyester laminate—model 1000—has been introduced by Peterson Bros. Boat Works.

Specifications of the model 1000 are:

Size: completely assembled 33 inches x 36 inches x 86 inches. Door opening, 23 inches x 76 inches.

Glass: 7/32 inch safety glass, Durolite, set in vinyl glazing strips.

Doors: Self closing, extruded aluminum, folding leaf type. One handle on each door that opens inward.

Trim: Aluminum, 1 inch x .063 around windows, 1 inch x .040 around doors.

Ventilation: Two, aluminum louver type, screened, 4 inches x 12 inches located 18 inches from bottom.

Lighting: Two sockets for 60 watt incandescent, 110 volt ac bulbs set over

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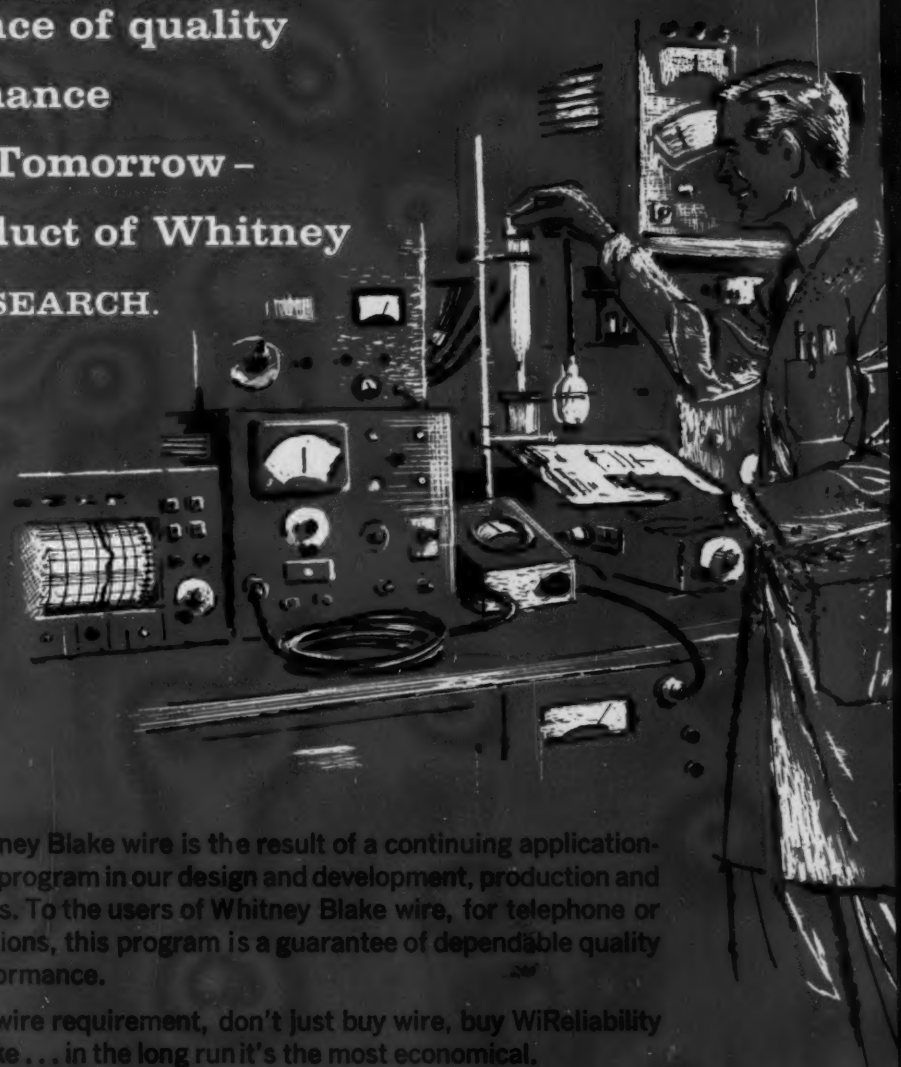

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hinged translucent Fiberglas panel, weather-stripped to eliminate bugs and dust in lighted hood. Light shows through 3 telephone decals and down into booth.

Purse Shelf: Preformed of Fiberglas 10 inches x 24 inches, white. Moulded into corner under telephone.

Weight: Net, 185 pounds. Packaged, 210 pounds.

Wiring Inlets: Polyvinyl caps, two at top and two at bottom of booth.

Telephone Mounting: Four steel ¼ inch machine screws tapped into steel straps molded into Fiberglas back panel. All entry wires for telephone and electricity separated by conduit in panel.

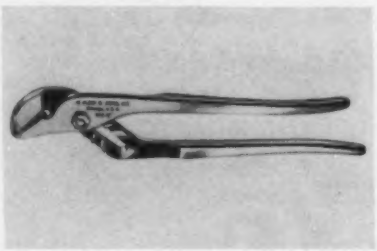
Booth Mounting: Six lag bolts or studs into 42 inches x 42 inches x 4 inches level concrete slab recommended for foundation poured at location by customer.

Shipment: Completely assembled at factory and shipped in cardboard cartons.

The booth comes in a red body and white top with the color impregnated in the resin. Request NP 1857.

•

PUMP PLIERS—Mathias Klein & Sons, Inc. are offering a new line of pump pliers in which the jaws are positioned and locked into place by engaging a tongue in the proper groove.



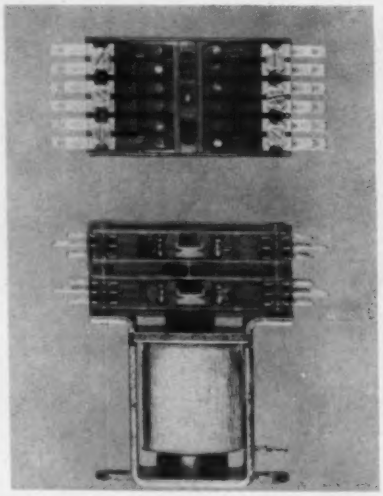
Wide bearing surface is said to assure a solid grip and jaws will not slip even under heavy pressure. The sides are polished and handles are blued.

Ten inch and 12-inch sizes are available with or without yellow plastic handles. The 16-inch size is available only with yellow plastic handle. Request NP 1858.

•

RELAY SWITCH— The new patented "T-Bar" switch/relay recently developed by Electronic Controls Inc., is said to represent the first revolutionary idea in relays to be offered in the past decade.

Originally developed as a small compact switching device for as many as 36 SPDT contacts, it is finding many applications either as a switch or relay wherever size and density are important.



The basic relay-switch can be flush mounted for easy wiring access, contacts are in a dust tight enclosure and any number of contacts from one to 36 can be actuated simultaneously, Electronic Controls reports. There are no pivot pins or wearing parts and the contacts perform a wiping action when closing.

Wafers containing additional contacts can be easily added. For switch operation, a lighted pushbutton can be mounted on the relay for manual or remote actuation.

Original designs incorporate a 24 volt coil, 2 amp resistive contacts with operate time of 15 milliseconds and release time of 10 milliseconds. Additional coil sizes and current ratings are also available by consulting factory. In addition, operate and release times can be varied. Request NP 1859.

Revised Line Safety Rules Text Is Now Available

Revised safety rules for the installation and maintenance of communications and electric lines to coincide with current practices and new technical developments are now available, the American Standards Association reports, in announcing the approval of the Standards.

The rules were eight years in preparation and were developed by a 20-member sectional committee.

The text is available from the U. S. Government Printing Office, Washington 25, D. C. or from the American Standards Association at 10 E. 40th St., New York, N. Y. The price is $1.75 per copy.

ILLUSTRATION:
BUG'S EYE view of a lighted Canopy Booth by night.

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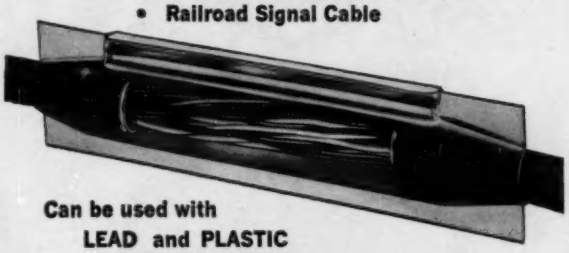

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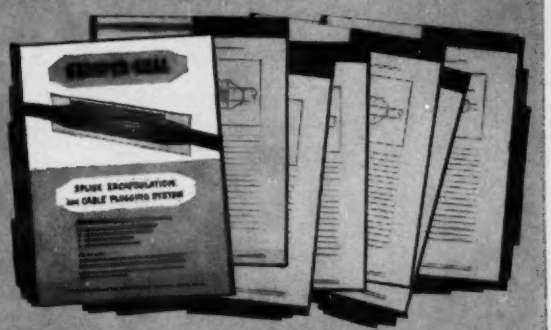

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Independents Show 5% Station Gain in 1961

The Independent telephone industry, as of Dec. 31, 1961, was comprised of 3,035 companies, serving 10,700 exchanges and 12 million telephones.

The 1961 year-end official statistics of the Independents, which have been released by the United States Independent Telephone Association, show that total plant investment during 1961 increased from 4 million dollars to 4.5 million dollars.

Due to mergers and consolidations the number of Independent companies decreased from 3,300 to 3,035. Gross revenues increased from $1,028,500,000 to $1,148,000,000, and stations increased from 11,428,000 to 12,000,000, a gain of 572,000, or 5 per cent. Ninety-two per cent of the Independent telephones are now dial operated.

The following comparison of Bell System and Independent industry statistics, of Dec. 31, 1961, was released by USITA:

	Independent	Bell System	Total
Total telephones	12,000,000	65,508,000	77,508,000
No. of operating companies	3,035	24	3,059
No. of exchanges	10,700	6,700	17,400
Investment in telephone plant	$4,500,000,000	$26,620,500,000	$31,120,500,000
Gross revenues	$1,148,000,000	$ 8,616,214,000	$ 9,764,214,000
No. of employes	100,000	581,250	681,250

Ehinger of Western Electric Is Named to BDSA Post

Robert F. Ehinger, assistant purchasing agent of the Western Electric Co., Inc., New York, N. Y. recently was named assistant director for mobilization planning, Communications Industries Division, Business & Defense Services Administration, (BDSA) U. S. Department of Commerce.

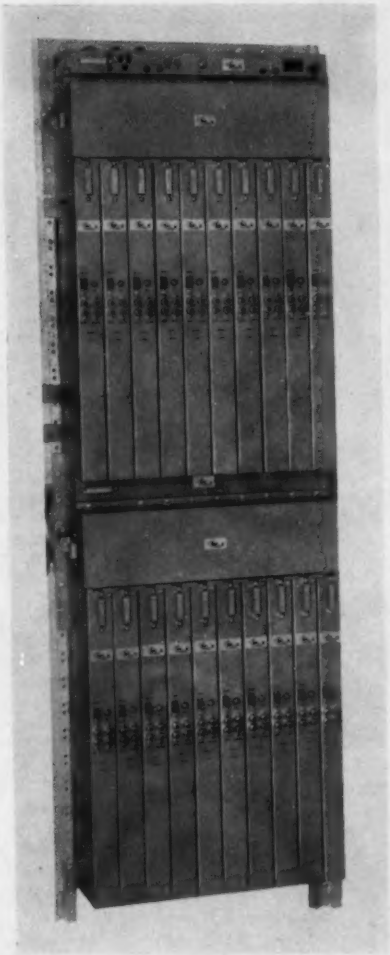
Mr. Ehinger joined BDSA from Western Electric Company, under the arrangement by which industry makes the services of key executives available for temporary assignment without compensation from the government. The service also will qualify him for membership in the National Defense Executive Reserve, which would staff the operation of a production agency in the event of a national emergency.

Mr. Ehinger spent most of his early life in Dover, Del.

He obtained a Bachelor of Arts degree from Dartmouth College in 1943.

Following three years in the Navy during World War II as a supply officer, he joined Western Electric Co. in New York in 1946. He had a

At recent swearing-in scene in Washington, D.C. for Robert F. Ehinger (right) as Assistant Director for Mobilization Planning, Communications Industries Division of the Business and Defense Services Administration, officiating in ceremony were (left to right): Eugene P. Foley, BDSA Administrator; and Hickman Price Jr., Assistant Secretary of Domestic Affairs. Mr. Ehinger has been serving as assistant purchasing agent of Western Electric Co., N.Y.



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series of assignments at various company locations, and was appointed to the post of assistant purchasing agent in 1960.

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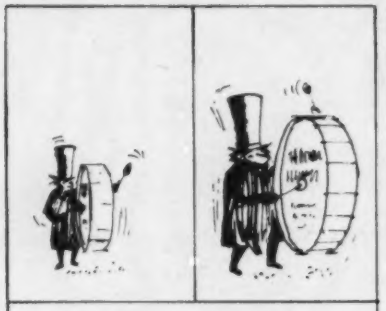
"I consider it a mark of great prudence in a man to abstain from threats or any contemptuous expressions, for neither of these weakens the enemy, but threats make him more cautious, and the other excites his hatred, and a desire to revenge himself."—MACHIAVELLI.



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HELP WANTED

CHIEF ENGINEER—with background as plant superintendent for progressive Northern California telephone company. Write Assistant General Manager, P. O. Box 1789, Redding, Calif.

ACCOUNTANTS: Regulatory commission interested in junior and senior accountants. College education and experience in utility accounting. Write Box No. 4680, c/o TELEPHONY.

MANAGER—Central office maintenance combination man; needed at once for one exchange dial system located at Dell City, Tex. Excellent opportunity for a qualified man with telephone cooperative expected to double in size within the near future. Write Dell Telephone Cooperative, Box 125, Brackettville, Tex.

DIVISION PLANT SUPERINTENDENT. For multi-exchange company serving 45,000 stations located in midwest. Applicant must be experienced, including outside plant, central office buildings, carrier application, budgets, and detailed work orders. Salary (plus fringe benefits) commensurate with experience and qualifications. Write Box No. 4671, c/o TELEPHONY.

TELEPHONE ENGINEERS

WANTED BY REA

Rural Electrification Administration has an opening in Washington, D.C., for a highly experienced Central Office Equipment Engineer; duties involve advice and assistance on all aspects of central office equipment facilities. Salary $12,210 a year.

Also several other openings for Telephone Engineers; duties involve design and construction and techniques in connection with operation and maintenance of telephone plant facilities. Starting annual salaries $7,095, $8,340 or $8,955, depending on experience. Liberal fringe benefits. Selections made under Federal Civil Service competitive regulations. Apply Henry C. Starns, Director, Personnel Management Division, Section A-1, Rural Electrification Administration, U.S. Department of Agriculture, Washington 25, D.C.

HELP WANTED

CABLE SPLICER, LINEMAN familiar with Bell System specifications. Needed immediately. Send resume to Box No. 4666, c/o TELEPHONY.

AMBITIOUS MEN qualified as Station Installers, Equipment Installers, Cable Splicers, Linemen. Work in Midwest. Harris-McBurney Company, Inc., P.O. Box 267, Jackson, Mich.

MANAGER FOR TEN EXCHANGES. Dial system in Southwest Texas serving approximately 2,500 stations. Applicants should state age, qualifications and minimum acceptable starting salary. Write Hill Country Telephone Cooperative, Inc., P.O. Drawer D, Ingram, Tex., c/o Selection Committee.

ACCOUNTANT experienced in FCC revenue, disbursement and general books as general auditor and assistant treasurer for growing class A telephone company in Texas; headquarters in county seat. Applicants state age, experience, salary expected and references. Write Box No. 4652, c/o TELEPHONY.

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Requires thorough background in design of telephone plants, underground, aerial cable and open wire in accordance with Bell specifications. Send resume to I. F. Markham, National Scientific Labs, Inc., 2010 Massachusetts Ave., N.W., Washington 6, D. C.

HELP WANTED

TELEPHONE ENGINEERS, experienced telephone dial system engineers for toll and dial central office equipment. Must have at least two years telephone operating company experience engineering dial central offices, toll, or exchange. Salary commensurate with experience and ability, with a large, expanding telephone company in Florida. All replies confidential. Please send resume and photograph to Box No. 4673, c/o TELEPHONY.

TELEPHONE ENGINEERS, experienced telephone carrier and radio system engineers. Must have at least two years telephone operating company experience in engineering point-to-point radio, mobile radio, or cable carrier systems. Salary commensurate with experience and ability with a large, expanding telephone company in Florida. All replies confidential. Please send resume and photograph to Box No. 4674, c/o TELEPHONY.

PLANT ACCOUNTANT, fully qualified to maintain continuing plant records, perpetual inventory controls and construction progress ledgers. Thorough knowledge of time and material reporting required, plus ability to train and supervise employees in related work. Excellent opportunity, with fast-growing Florida Company. Summarize past experience and state acceptable beginning salary in first reply, if between 28 and 45 years of age. Write Box No. 4676, c/o TELEPHONY.

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MANAGER WANTED for REA financed telephone company, 2000 stations. Located in northeastern Kansas. State qualifications, experience and salary desired. Closing date for applications, April 30, 1962. Write W. M. Shaffer, Attorney, Frankfort, Kan.

1401 PROGRAMMER AND SUPERVISOR for growing Class "A" telephone company in Calif. Require B.B.A. degree, tab supervisory experience, and thorough knowledge of accounting. Applicants state age, experience, salary expected and references. Write Box No. 4675, c/o TELEPHONY.

PLANT MANAGER for 3100 modern suburban well financed Independent. S-C 100% dial. Ideal management and working conditions. Growth area. No office or management work. Adequate vacation, Blue Cross etc. An opening for an ambitious young man who is blocked up ahead or for middle aged applicant who can plan ahead as well as operate plant. All applications confidential. No contacts in your community will be made without your special permission. In reply tell us what you can do and how much willing to start. If photo available send. Write George D. Barnard, Box No. 4670, c/o TELEPHONY.

POSITION WANTED

MANAGER desires to relocate, Missouri - Arkansas - Oklahoma. Highly experienced in REA procedures, general tariffs, commercial, dial maintenance and construction. Bond and character references. Write Box No. 4679, c/o TELEPHONY.

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AMBITIOUS PLANT ENGINEER. 13 years diversified telephone background. Experience supervising plant, commercial and engineering personnel. Capable making management and policy decisions. Available interview June. Write Box No. 4682, c/o TELEPHONY.

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TELEPHONE COMPANY with 2500 stations or less. Will keep management and personnel if desired. Write Box No. 4664, % TELEPHONY.

SMALL TELEPHONE COMPANY to operate myself or to buy interest as working partner, dial exchange not necessary. Write Box No. 4681, c/o TELEPHONY.

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WANTED ALL MAKES OLD TELEPHONES—our truck will pick up and pay you Cash on the spot. Telephone Co., Turtle Lake, Wis.

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900-20 10-ply New Heavy Army Tread, 1st	62.50
1000-20 12-ply New Heavy Army Tread, 1st	78.50
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ONE 1956 F. 500 LINE TRUCK, 2 winches, 2 rapid forward and reverse transmissions, 2-speed digger transmission—all in excellent condition, $1875.00. One 1956 F. 600 line truck, double drum winch, 2-speed power divider, cable carrying and placing rig. A real buy for $2575.00. Write Morton Contracting Co., Inc., P. O. Box 11, Cherokee, Ia.

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Metal Housings for the 1000 series Kellogg Cradle Telephones. Black hard baked enamel finish. $3.00 each.

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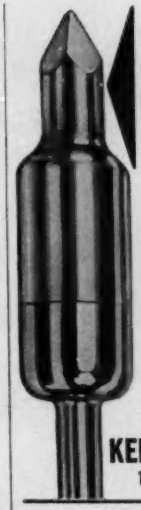

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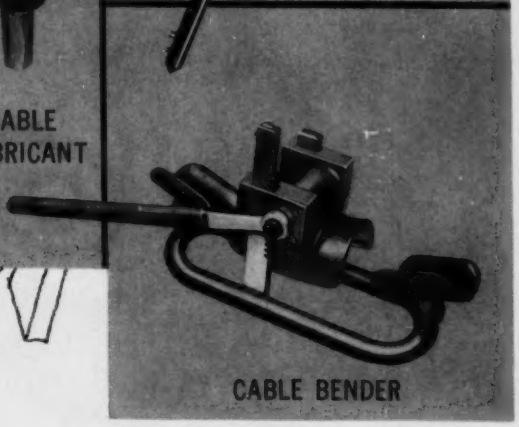

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